October 16, 2015

Honorable Members of the West Hartford Town Council
Town of West Hartford
Town Hall
50 South Main Street
West Hartford, CT 06107

RE: Change of Zone from R-6 to RM-MS and then to Special Development District for Proposed Conversion of Existing Building and Construction of New Buildings into 310 Apartment Units and Relocation of Existing 36 Residential Living Units at 27 Park Road and 14 Ringgold Street, West Hartford, Connecticut

Dear Mayor Slifka and Honorable Members of the Town Council:

Application is hereby filed on behalf of Center Development Corporation ("CDC"), contract purchaser and intended developer, and The Sisters of St. Joseph Corporation ("SSJC"), owners of 27 Park Road and 14 Ringgold Street, West Hartford, Connecticut (the "Property") (collectively, "Applicants"). The Applicants propose to redevelop the existing buildings at the Property and to construct new buildings to house 310 apartment units, which will be owned by CDC, and 36 residential living units which will be owned by the SSJC, together with all attendant parking (including garage structures), landscaping, lighting and signage. This letter, together with the accompanying plans and reports, constitute the Applicants' request to rezone the majority of the Property to RM-MS and then to designate the rezoned area a Special Development District, in order to proceed ("Application").

A legal description of the boundary of the property that is the subject of the Application and for which the zone change and SDD designation are requested, is attached to this letter as Enclosure B, which, together with Enclosures A - L described at the end of this letter, should be deemed incorporated as part of the Application.

Planning for this development began in 2012 when the SSJC issued a Request for Proposals for the redevelopment of the property owned by the SSJC ("RFP"). CDC replied to the RFP and was selected by the SSJC as the preferred developer for the property. The Applicants entered into a Purchase and Sale Agreement in 2013 and since that time, CDC and its consultants have been meeting with Town staff, the Design Review Advisory Committee ("DRAC") and neighbors and neighborhood groups in both West Hartford and Hartford. CDC has gone through several iterations of proposed plans, attempting to address therein all concerns raised by DRAC, Town staff and neighbors. We believe that the plans presented to the Town Council as part of the Application and the implementation of those plans will be an improvement to the Property,

represent a significant benefit to this area of Town, and will be an asset to the West Hartford community.

OVERVIEW OF PROPOSAL:

The proposal contains two separate components, each of which is to be developed separately. First, the SSJC intend to consolidate their current operations and residential living spaces into one wing of the existing building. They propose to re-use the west wing of the existing building for 36 residential living units for vowed women religious and for the associated facilities necessary or useful for the support of the sisters living at the premises, such as kitchen and dining facilities, common rooms and a chapel, communal gardens and service facilities. This proposed use is a pre-existing use so the only change is the consolidation of the living units and accessory facilities into one wing. An application for a building permit to accomplish the same has already been submitted to the Town.

The second component of the development is the re-use of the remainder of the existing primary building and the construction of additional buildings for the development of 310 apartment units by CDC. The redevelopment of the remainder of the existing building (the core building, the middle and east wing and the chapel) will include 66 apartment units in the core building and the two wings and the creation of a community center-type of use within the former chapel. CDC will be constructing 244 apartments in newly constructed buildings located at the side of and to the rear of the existing buildings. In addition, CDC will develop both surface and garage parking to include 550 spaces, several outdoor landscaped and recreational areas, including a pool and a tennis court as well as walking paths in and through the undeveloped portion of the site.

The Applicants request that the following substitute standards become applicable to this SDD in lieu of those set forth in the RM-MS and other zoning regulations:

1. Minimum Front Yard – Parking: Reduce minimum front yard parking requirement from 20' to 19'.

2. Parking Dimension: Reduce parking space width for non-compact spaces within a garage structure to 9 feet.

3. Parking Lot Landscaping: Allow the parking lot landscaping to be provided clustered at the boundaries of the parking lot rather than distributing them throughout the entire parking lot.

4. Maximum Horizontal Building Dimension: Increase the maximum horizontal building dimension to 635'.

5. Required Loading Spaces: Decrease required loading spaces for the development to 3.5.

6. Courtyard: Substitute distance standards as shown on the plans.

7. Signs: Substitute standards for number size, location and height as shown on the plans.

8. Fences: Substitute standards for height based on location as shown on the plans.

TRAFFIC AND PARKING CONSIDERATIONS:

Bubaris Traffic Associates ("BTA") has prepared a Site Traffic Evaluation with respect to the activities and uses included with in the Application. The BTA report is attached hereto as Enclosure G. The BTA report indicates that the proposed project should not adversely impact traffic operations in the area, nor should it alter the levels of service in the nearby intersections. Last, no traffic improvements are required as a result of the added traffic.

DESIGN AND LANDSCAPING ELEMENTS:

The design and layout of the site were dictated by the preservation and re-use of the existing buildings on the site and CDC's desire to preserve as much open space as possible. Significant time was spent with DRAC to minimize the impact of the new buildings from both the Park Road and Prospect Street perspectives. Most attention was paid to the new east building and its facades on both Park Road and Prospect Avenue. The portion of the new east wing that faces Park Road was designed to complement (but not necessarily mimic) the facade of the existing building. The Prospect Avenue façade was designed with architectural features that break up the façade to provide interest, minimize the appearance of its size and, again, to complement but not necessarily mimic the original buildings on the site. The south building is tucked in behind the existing buildings and, although of a greater height than the existing buildings, will not be visible from Park Road by virtue of the fact that the sites slopes to the south. In order to minimize the project's impact on the site, to minimize activities in the wetlands and regulated areas and to prevent any adverse impacts on stormwater, CDC elected to construct parking structures on the site, rather than provide all surface parking. The parking structures are tucked under both the new east wing and the south wing. 273 spaces are provided in the parking structures and 277 spaces are surface spaces.

The landscape design on the site was planned to accomplish several goals, which included compliance with the zoning requirements, preservation of existing landscape where possible, provision of appropriate screening and preservation the meadow and forest are on the south side of the property. The existing landscaping on Park Road and Prospect Avenue, that is essentially overgrown and scruffy, will be replaced with new landscaping and hardscape that will allow for appropriate screening while also creating a sense of place and providing aesthetic interest. The proposed landscaping and hardscape will also be carried along Prospect Avenue to the existing stream crossing. Parking lot landscaping has been clustered along the perimeter of the surface parking lots primarily for two reasons – to minimize increasing the area covered by pavement and to preserve the southern views across the meadow to the forest for the south-facing apartment units. Additional landscaping is also being provided along the west side of the property to provide screening from Ringgold Street of the proposed buildings and new parking areas.

WATER, SEWER AND STORMWATER CONSIDERATIONS:

Design Professionals, Inc. ("DPI") has prepared a Storm Drainage Report that is attached hereto as Enclosure H. In addition, DPI has also contacted The Metropolitan District and the Health Director regarding availability of water and sewer to serve the project. Letters from each are attached hereto as Enclosures I and J and indicate that both water and sewer are available to service the proposed development of the Property. The Storm Drainage Report indicates both that the peak rates of stormwater runoff discharging to neighboring properties for the 5-, 10-, 25-, and 100-year storm events will be less after development than prior to development. In addition, the proposed stormceptor unit will serve to remove suspended solids of runoff collected from the northerly and westerly parking areas before discharging to the proposed detention basin for the site. The report concludes that the proposed stormwater management design as presented in the Application will not pose any significant detrimental impacts to the environment surrounding the site.

NEIGHBORHOOD CONSIDERATIONS AND COMMUNITY OUTREACH:

The Applicant has retained Coursey & Company ("CC") to perform community outreach in conjunction with this project. As of the date hereof, CC has met with individual property owners and numerous neighborhood and civic organizations in both West Hartford and Hartford. These individual and group meetings will continue as the application process goes forward until all public hearings on the application shave been closed. A copy of a preliminary report is attached hereto as Enclosure F.

PURPOSE AND COMPLIANCE WITH POCD:

The Application is consistent with the goals and objectives of the Town's Plan of Conservation and Development, a discussion of which follows below.

Housing: The goal for housing in the POCD is to "enhance and maintain West Hartford's housing stock and encourage a diversity of housing types and costs. Enhance the beauty of our neighborhoods by encouraging streetscape improvements, including home preservation and the planting of mature and diverse trees." The proposed development will certainly enhance the Town's housing stock, providing new and interesting housing in both new and rehabilitated buildings. The proposed development will also enhance the beauty of the neighborhood by providing new fencing, lighting, landscaping, hardscaping and a relocated bus stop and through the preservation of open space.

Economic Development: The goal for economic development is to promote economic growth while retaining existing businesses and protecting the residential character of the surrounding neighborhoods. The proposed development will certainly promote economic development along the Park Road neighborhood, bringing hundreds of new residents into the neighborhood to patronize the existing businesses in the area. The Applicants have met numerous times with the

Park Road Association and believe that the Association is supportive of the positive economic impacts this project will have on the neighborhood

Traffic and Transportation: The goal for traffic and transportation is to promote a system that provides the best possible service, mobility, convenience and safety while reinforcing positive influences on the Town. The proposed development is ideally situated to provide both easy and convenient highway access without adversely impacting Town streets, traffic and circulation and to provide excellent access to public transportation, with a bus stop literally right outside the project's front door. The Applicant is proposing improvements that will relocate the bus stop, providing a safer location for those utilizing public transport while also providing safer traffic patterns at the Park Road and Prospect Avenue intersection.

Historic Preservation: The goal for historic preservation is to preserve, protect and enhance the architectural integrity and physical record of the history and growth of West Hartford, which includes a policy of promoting and enhancing the viability of historic resources for their continued use. The Sisters of St. Joseph have been located at this location in the Town of West Hartford for over 100 years, constructing the first building on the site in 1898. The structures on the site are distinctive and beautiful and this development will allow the preservation of the existing primary buildings on site as well as allowing the Sisters to maintain their presence in and connection with the Town of West Hartford. There are very few uses and even fewer users for such old and large buildings. The opportunity to have such a large resource both preserved and productively reused while maintaining the historic character of the property fits squarely within the Town's goals.

Open Space: The goal of open space is basically to preserve and expand open spaces. This development has been designed with that specific goal in mind. The Applicants are providing structured parking (at significantly more expense that surface parking), have condensed the development footprint on the site and are proposing less than one-half of the density that would be allowed on the site under the RM-MS zone. Once completed, approximately 75% of the site will remain open space.

FINDINGS:

The change of zone and the designation of the Property as an SDD to allow the Applicants to redevelop the existing buildings at the Property and to construct new buildings containing 310 apartment units to be owned by CDC and 36 residential living units to be owned by SSJC, together with all attendant parking (including garage structures), landscaping, lighting and signage is deemed appropriate for the following reasons as set forth in the Zoning Code Section 177-44B:

1. The proposed changes as set forth in the Application are in harmony with the overall objectives of the Comprehensive Plan as they will provide additional market-rate multi-family residential use without overcrowding the land, will preserve and enhance the existing buildings on the Property and provide an effective re-use thereof, will provide for significant open-space

allowing for adequate light, air and privacy and will benefit significantly this section of the Town.

2. The proposed SDD is superior to a plan possible under the regular standards of the Regulations because of the additional scrutiny allowed in the building design and layout process for multi-family. In addition, the minimal substitute standards in the design standards presented in the application will benefit the design and use of the Property by allowing for a more condensed development, thus retaining significantly more of the Property in a natural state and minimizing the impact on the neighbors from construction of the new buildings.

3. The proposed improvements are clearly in harmony with the neighborhood as a significant portion of the development is the retention and re-use of the existing 185,818 SF historic building. The new buildings are primarily oriented towards Prospect Avenue, which is a commercial street, and the rear of the property, where the existing vegetation on the south side of the property and the distance from Ringgold Street as well as the building orientation will result in little impact to the existing buildings in West Hartford. In addition, CDC has worked closely with DRAC to ensure that the materials used and the elevations of the new buildings will fit in with this area. This neighborhood is a mixture of commercial, multi-family and single family buildings and uses and the proposed uses continue the multi-family use of the area as well as bringing new liveliness to this area and having a significant beneficial impact on the businesses in the area. The proposed improvements will not have a deleterious impact on the character of this area or on the orderly permitted development of the adjacent residential and commercial properties.

4. The total density of the development in terms of floor area, land coverage and dwelling units will be significantly less than is allowed in the proposed RM-MS zone.

The proposed Ordinance, application fee and information required pursuant to Section 177-44 of the Zoning Ordinance are enclosed.

Respectfully submitted,
Center Development Corporation

By: Susan A. Hays
Susan A. Hays
Updike, Kelly & Spellacy, P.C.
Its Attorney and Authorized Agent

Enclosures:

ENCLOSURE A – Application Letter signed by Owner
ENCLOSURE B – Descriptions of property subject to Zone Change and SDD Designation
ENCLOSURE C – Proposed Ordinance
ENCLOSURE D - Affidavit of Interest
ENCLOSURE E – Description of Proposed Uses
ENCLOSURE F – Community Outreach Report

ENCLOSURE G – BTA Site Traffic Evaluation
ENCLOSURE H – Storm Drainage Report
ENCLOSURE I – Letter from The Metropolitan District
ENCLOSURE J – Letter from West Hartford Director of Health
ENCLOSURE K – Application Fee Check made payable to Town of West Hartford
ENCLOSURE L – Plan set entitled "Arcadia Crossing, One Park Road, West Hartford, Connecticut, Zone Change & SDD Designation Application" prepared by Design Professionals, Inc., et. al. dated October 14, 2015

ENCLOSURE A
Application Letter signed by Owner

Sisters of Saint Joseph
of Chambery

Provincial Office
27 Park Road
West Hartford, Connecticut, 06119

October 12, 2015

Honorable Members of the West Hartford Town Council
Town of West Hartford
Town Hall
50 South Main Street
West Hartford, CT 06107

RE: Change of Zone from R-6 to RM-MS and then to Special Development District for Proposed Conversion of Existing Building and Construction of New Buildings into 310 Apartment Units and Relocation of Existing 36 Residential Living Units at 27 Park Road and 14 Ringgold Street, West Hartford, Connecticut

Dear Mayor Slifka and Honorable Members of the Town Council:

The Sisters of St. Joseph Corporation is the owner of the property commonly known as 27 Park Road and 14 Ringgold Street, which is the subject of a zone change and SDD application submitted to the Town Council as described above.

This letter is provided to indicate the property owner's consent to the submittal of the zone change and SDD application submitted by Center Development Corporation and the property owner's participation in that process.

If there is any further information that we can provide, please do not hesitate to let us know.

Respectfully submitted,
The Sisters of St. Joseph Corporation

By: Sister Elizabeth Anderson, CSJ
Sister Elizabeth Anderson, CSJ

ENCLOSURE B
Property Descriptions

PROPOSED ZONE CHANGE LINE

R-6 TO RM-MS

Beginning at a point in the easterly right-of-way line of Ringgold Street, said point being the southeasterly property corner of land N/F Sisters of St. Joseph Corp.

Thence in a westerly direction through Ringgold Street a distance of 26± feet to a point in the center line of Ringgold Road;

Thence in a northerly direction along the center line of Ringgold Street a distance of 47± feet to a point;

Thence in an easterly direction though Ringgold Street a distance of 27± feet to a point in the westerly property line of land N/F Sisters of St. Joseph Corp.

Thence S88°39'21"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 105.07 feet to a point;

Thence N51°59'37"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 112.84 feet to a point;

Thence N22°47'19"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 200.29 feet to a point;

Thence N73°34'38"W along the property line of N/F Sisters of St. Joseph Corp., a distance of 236.24 feet to a point on the easterly right-of-way line of Ringgold Street;

Thence in a westerly direction through Ringgold Street a distance of 27± feet to a point in the center line of Ringgold Street;

Thence in a northerly direction along the center line of Ringgold Street a distance of 354± feet to a point;

Thence in a northerly direction along the center line of Ringgold Street a distance of 399± feet to a point on the approximate existing southerly BG zone line in Park Road;

Thence in an easterly direction on Park Road along the approximate existing southerly BG zone line a distance of 915± feet to a point;

Thence in an easterly direction on Park Road along the approximate existing southerly BG zone line a distance of 79± feet to a point in the approximate Hartford & West Hartford town line;

Thence in a southerly direction along the approximate Hartford & West Hartford town line a distance of 821± feet to a point;

Thence in a westerly direction though Prospect Avenue a distance of 60± feet to a point being the southeasterly corner of land N/F Sisters of St. Joseph Corp.

Thence S89°26'23"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 187.69 feet to a point;

Thence N88°46'07"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 152.42 feet to an point;

Thence N88°46'08"W along the northerly property line of N/F Town of West Hartford, a distance of 198.06 feet to a point;

Thence N86°47'52"W along the northerly property line of N/F Town of West Hartford, a distance of 331.00 feet to an point;

Thence N88°39'21"W along the northerly property line of N/F Town of West Hartford, a distance of 168.96 feet to the point and place of beginning.

Boundary & Topographic plan prepared for: Sisters of St. Joseph Corp. Convent of Mary Immaculate 27 Park Road West Hartford, CT Date: 07/11/12 Revised 7-22-15 Sheet V1-01 and V1-02 Scale: 1" = 40' prepared by Design Professionals, Inc.

Area of zone change = 942,504 s.f., 21.64 acres.

LIMITS OF SDD DESIGNATION

Beginning at a point on the corner of the southerly right-of-way line of Park Road and the easterly right-of-way line of Ringgold Street, said point also being 14.94 feet northwesterly and 14.94 feet northeasterly of a concrete monument;

Thence S74°08'16"E along the southerly right-of-way line of Park Road a distance of 916.56 feet to a point;

Thence S02°18'36"W along the westerly right-of-way line of Prospect Avenue, a distance of 797.23 feet to a point;

Thence S89°26'23"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 187.69 feet to a point;

Thence N88°46'07"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 152.42 feet to an iron rod;

Thence N88°46'08"W along the northerly property line of N/F Town of West Hartford, a distance of 198.06 feet to a point;

Thence N86°47'52"W along the northerly property line of N/F Town of West Hartford, a distance of 331.00 feet to an iron rod;

Thence N88°39'21"W along the northerly property line of N/F Town of West Hartford, a distance of 168.96 feet to a point;

Thence N08°01'46"E along the easterly right-of-way line of Ringgold Street, a distance of 50.34 feet to a point;

Thence S88°39'21"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 105.07 feet to a point;

Thence N51°59'37"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 112.84 feet to a point;

Thence N22°47'19"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 200.29 feet to a point;

Thence N73°34'38"W along the property line of N/F Sisters of St. Joseph Corp., a distance of 236.24 feet to a point on the easterly right-of-way line of Ringgold Street;

Thence N08°01'46"E along the easterly right-of-way line of Ringgold Street, a distance of 354.15 feet to a point;

Thence N16°05'31"E along the easterly right-of-way line of Ringgold Street, a distance of 312.20 feet to the point and place of beginning;

Boundary & Topographic plan prepared for: Sisters of St. Joseph Corp. Convent of Mary Immaculate 27 Park Road West Hartford, CT Date: 07/11/12 Revised 7-22-15 Sheet V1-01 and V1-02 Scale: 1" = 40' prepared by Design Professionals, Inc.

Area of SDD Designation = 850,389 s.f., 19.52 acres.

ENCLOSURE C
Proposed Ordinance

An Ordinance Amending the Zoning Regulations
of the Town of West Hartford

BE IT ORDAINED BY THE TOWN COUNCIL OF WEST HARTFORD:

That the boundaries and districts shown on the Building Zone Map entitled "REVISED ZONING MAP, TOWN OF WEST HARTFORD, CONNECTICUT," which map is on file in the Town Clerk's Office of the Town of West Hartford, Connecticut, be and is hereby amended as follows:

The zoning district designation for that portion of 27 Park Road and 14 Ringgold Street as described below as "Zone Change Area" is hereby changed from R-6 to RM-MS and for that portion of 27 Park Road and 14 Ringgold Street described below "SDD Area" is then designated as a special development district, all in accordance with a set of plans entitled "Arcadia Crossing, One Park Road, West Hartford, Connecticut, Arcadia Crossing Renovation and Addition, Applicants: Center Development Corporation and Sisters of St. Joseph Corporation, Property Owner: Sisters of St. Joseph Corporation, Date: October 14, 2015" per the cover sheet, being sheet #1 , which set of plans consists of 76 sheets, including the cover sheet, to allow construction of 310 apartment units and 36 residential living units with attendant parking, landscaping, lighting and signage all as set forth in the plans filed with this Application as those plans may be changed, approved by the West Hartford Town Council and filed on the West Hartford Land Records. The property for which this zone change and special development district is approved is a portion of 27 Park Road and 14 Ringgold Street and is more particularly bounded and described below, with reference being made to map or plan entitled: "Zone Change Plan, Arcadia Crossing Renovation and Addition, One Park Road, West Hartford, Connecticut Date: 10/14/15 Sheet ZA-1 Scale: 1" = 80'" which map or plan is on file or to be filed in the Town Clerk's Office of the Town of West Hartford to which reference may be had.

The Zone Change Area is described as follows:

Beginning at a point in the easterly right-of-way line of Ringgold Street, said point being the southeasterly property corner of land N/F Sisters of St. Joseph Corp.

Thence in a westerly direction through Ringgold Street a distance of 26± feet to a point in the center line of Ringgold Road;

Thence in a northerly direction along the center line of Ringgold Street a distance of 47± feet to a point;

Thence in an easterly direction though Ringgold Street a distance of 27± feet to a point in the westerly property line of land N/F Sisters of St. Joseph Corp.

Thence S88°39'21"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 105.07 feet to a point;

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Thence N22°47'19"E along the property line of N/F Sisters of St. Joseph Corp., a distance of 200.29 feet to a point;

Thence N73°34'38"W along the property line of N/F Sisters of St. Joseph Corp., a distance of 236.24 feet to a point on the easterly right-of-way line of Ringgold Street;

Thence in a westerly direction through Ringgold Street a distance of 27± feet to a point in the center line of Ringgold Street;

Thence in a northerly direction along the center line of Ringgold Street a distance of 354± feet to a point;

Thence in a northerly direction along the center line of Ringgold Street a distance of 399± feet to a point on the approximate existing southerly BG zone line in Park Road;

Thence in an easterly direction on Park Road along the approximate existing southerly BG zone line a distance of 915± feet to a point;

Thence in an easterly direction on Park Road along the approximate existing southerly BG zone line a distance of 79± feet to a point in the approximate Hartford & West Hartford town line;

Thence in a southerly direction along the approximate Hartford & West Hartford town line a distance of 821± feet to a point;

Thence in a westerly direction though Prospect Avenue a distance of 60± feet to a point being the southeasterly corner of land N/F Sisters of St. Joseph Corp.

Thence S89°26'23"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 187.69 feet to a point;

Thence N88°46'07"W along the northerly property line of N/F Prospect Plaza Improvements LLC, a distance of 152.42 feet to an point;

Thence N88°46'08"W along the northerly property line of N/F Town of West Hartford, a distance of 198.06 feet to a point;

Thence N86°47'52"W along the northerly property line of N/F Town of West Hartford, a distance of 331.00 feet to an point;

Thence N88°39'21"W along the northerly property line of N/F Town of West Hartford, a distance of 168.96 feet to the point and place of beginning.

Boundary & Topographic plan prepared for: Sisters of St. Joseph Corp. Convent of Mary Immaculate 27 Park Road West Hartford, CT Date: 07/11/12 Revised 7-22-15 Sheet V1-01 and V1-02 Scale: 1" = 40' prepared by Design Professionals, Inc.

Area of zone change = 942,504 s.f., 21.64 acres.

The SDD Area is described as follows:

Beginning at a point on the corner of the southerly right-of-way line of Park Road and the easterly right-of-way line of Ringgold Street, said point also being 14.94 feet northwesterly and 14.94 feet northeasterly of a concrete monument;

Thence S74°08'16"E along the southerly right-of-way line of Park Road a distance of 916.56 feet to a point;

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Thence N08°01'46"E along the easterly right-of-way line of Ringgold Street, a distance of 354.15 feet to a point;

Thence N16°05'31"E along the easterly right-of-way line of Ringgold Street, a distance of 312.20 feet to the point and place of beginning;

Boundary & Topographic plan prepared for: Sisters of St. Joseph Corp. Convent of Mary Immaculate 27 Park Road West Hartford, CT Date: 07/11/12 Revised 7-22-15 Sheet V1-01 and V1-02 Scale: 1" = 40' prepared by Design Professionals, Inc.

Area of SDD Designation = 850,389 s.f., 19.52 acres.

ENCLOSURE D
Affidavit of Interest

AFFIDAVIT OF INTEREST

The undersigned, being duly sworn, hereby deposes and says that, to the best of his ability:

The names and addresses of any persons firms or corporations having a direct or indirect interest in a personal or financial sense in the request by Center Development Corporation to change the zoning district designation of the property known as 27 Park Road and 14 Ringold Street (the "Property") to RM-MS and to subsequently change the zoning designation of the Property to SDD to allow the construction of 310 units of housing and 36 congregate care units are as follows::

Center Development Corporation (William N. Hubbard III, President) located at 1 Gateway Plaza #2, Port Chester, NY 10573; and

The Sisters of St. Joseph Corporation (Susan Cunningham, CSJ, President) with an office at 650 Willard Avenue, Newington, Connecticut 06111.

In Witness Whereof, the undersigned has executed this Affidavit on the 1 day of October, 2015.

Printed Name: William N. Hubbard III

STATE OF NEW YORK)
) ss: _____
COUNTY OF New York)

Subscribed and sworn to before me this 1 day of October, 2015.

Notary Public
My Commission Expires:

JANE A. DWYER
Notary Public State of New York
No. 01DW4889935
Qualified in New York County
Commission Expires April 20, 2019

ENCLOSURE E
Description of Proposed Uses

The proposed project consists of two primary proposed uses. The Sisters of Saint Joseph will own the west wing of the existing building and will be converting that into 36 residential units for vowed women religious and will have associated facilities necessary or useful for the support of the sisters living at the premises, such as kitchen and dining facilities, common rooms and a chapel, communal gardens and service facilities. The Sisters will maintain ownership of the courtyard to the west of the west wing and will have exclusive use of the parking spaces directly to the west of the west wing and a specific number of those located to the north on the west wing.

The remainder of the building and land will be owners by Center Development Corporation ("CDC") and will be developed into 310 apartment units with associated parking, landscaping and other amenities. CC will develop 66 apartment units in the remainder of the existing buildings on the site and will convert the chapel to a community center-type of use. CDC will also build approximately 292,122 SF of new building housing 244 apartment units and approximately 114,819 SF of new garage structure. CDC will also be developing resident amenities such as a swimming pool, courtyards, a tennis court and walking paths. The apartment breakdown is anticipated to be 41 studios, 113 one bedroom and 156 two bedrooms.
There will be 550 parking spaces in total on the site, 273 of them located within the garage structures and 277 located on the surface parking.

ENCLOSURE F
Community Outreach Report

Coursey & Company
Public Affairs Communications
PO Box 271834 * West Hartford, CT 06127
860 232-9800 * chuck@courseyco.com

October 14, 2015

TO: West Hartford Town Planning and Zoning Commission
West Hartford Town Council

FROM: Chuck Coursey

RE: Preliminary Community Neighborhood Outreach Report
Sisters of St. Joseph/Arcadia Crossing
27 Park Road and 14 Ringgold Street

Please find a preliminary outreach summary of contacts with neighbors of the Arcadia Crossing Project/27 Park Road and 14 Ringgold Street. Outreach is a daily activity and will continue until all Town public hearings and meetings have been closed. Updated outreach reports will be provided at each public hearing.

A total of 95 residential homes and businesses, plus the Twin Oaks Condos and the Kane Street Shopping Plaza, are all being approached individually. A breakdown by street is as follows:

• Park Road	18 homes/businesses
• West Beacon Street	2 homes
• Warren Terrace	14 homes
• Tobey Street	5 homes
• South Highland Street	8 homes
• Ringgold Street	10 homes
• Prospect Avenue	7 homes/businesses
• Gillette Street	5 homes
• Fairlawn Street	2 homes
• Crescent Street	21 homes
• Twin Oaks Condos	100 Units
• Kane Street Shopping Plaza	

In addition, the following West Hartford and Hartford businesses and organizations have been met with and will be provided updates:

- Park Road Association
- Playhouse on Park
- West Hartford Chamber of Commerce Economic Development Committee
- West Hartford Fire Department
- Parkville Business Association (Hartford)
- Parkville Neighborhood Revitalization Zone (Hartford)
- Real Art Ways (Will K. Wilkins)
- Kessler Construction
- Mayflower Laundry Owners
- Damon's Tavern Property Owner
- Thomas Deller, Director of Development Services, City of Hartford

Please feel free to contact me at 860-232-9800 with any questions.

ENCLOSURE G
BTA Site Traffic Evaluation

Bubaris Traffic
ASSOCIATES
Planning • Engineering • Design

James G. Bubaris, P.E.
Principal

October 2, 2015

Mr. Peter DeMallie, Principal
Design Professionals, Inc.
21 Jeffrey Drive
South Windsor, CT 06074

Re: Site Traffic Evaluation Study
Proposed Arcadia Crossing
Park Road at Prospect Avenue
West Hartford, Connecticut

Dear Mr. DeMallie:

In collaboration with Design Professionals, Inc., we have worked together to prepare the subject Site Traffic Evaluation Study which addresses the proposal to convert the existing Sisters of Saint Joseph residential facility located at the southwest corner of the intersection of Park Road/Park Street at Prospect Avenue, in the Town of West Hartford, into a private low-rise apartment complex.

Introduction

Please refer to Exhibit 1 of the Appendix which locates this site with respect to the surrounding roadway network, and to Exhibit 2 of the Appendix which provides a Site Plan showing the proposed Arcadia Crossing residential facility.

It is our understanding that the facility will house a total of 346 apartment units, with 36 of these units set aside for the Sisters of Saint Joseph, and the remaining 310 units open for rental by the general public.

The site will be served by two, two-way, unsignalized site drives, with the North Site Drive intersecting the south side of Park Road about 750 feet west of Prospect Avenue, and the East Site Drive intersecting the west side of Prospect Avenue about 375 feet south of Park Road.

It is anticipated that the proposed residential development will be completed and fully occupied by mid-2017.

Study Scenarios

In conducting the traffic operational analyses that follow, three study scenarios were developed and considered:

PO Box 4250 • Yalesville, CT 06492 • Phone: 203-265-8086 • Cell: 203-606-4742
• JimBubaris@hotmail.com •

- Existing 2014 AM and PM Peaks: This represents the existing conditions on the surrounding roadway network with the existing Sisters of Saint Joseph facility in operation and the year when the manual turning movement counts of the defined study intersections were conducted.

- Background 2017 AM and PM Peaks: This represents the no-build condition on the surrounding roadway network 3 years hence to when the subject development is planned to be completed and occupied. Existing 2014 manual turning movement counts were increased by a factor of 2 percent per year for each of 3 years to yield these 2017 projections assuming normal background traffic growth based on data obtained from the Connecticut Department of Transportation (CTDOT).

- Combined 2017 AM and PM Peaks: This represents the build condition on the surrounding roadway network when it is assumed that the subject development will be completed and fully occupied.

Background Conditions

Given the nature of this development and the manner in which it interfaces with the surrounding roadway network, the selected study area for the subject development consists of the following intersections shown in the location map included as Exhibit 1 of the Appendix:

- Park Road at South Highland Street:

  This is a 3-way, unsignalized intersection with Park Road running east-west and South Highland Street as the north leg of the intersection. All approaches to this intersection are one lane wide, and the South Highland Street southbound approach is controlled by a Stop sign.

- Park Road at Ringgold Street:

  This is a 3-way, unsignalized intersection with Park Road running east-west and Ringgold Street as the south leg of the intersection. All approaches to this intersection are one lane wide, and the Ringgold Street northbound approach is controlled by a Stop sign.

- Park Road at Proposed North Site Drive:

  This will be a 3-way, unsignalized intersection with Park Road running east-west and the proposed North Site Drive as the south leg of the intersection. The Park Road eastbound and westbound approaches to this intersection will each remain one lane wide. The Proposed North Site Drive will have two inbound and two outbound lanes separated by a raised median, and the two outbound lanes will be controlled by a Stop sign.

- Park Road and Park Street at Prospect Avenue:

  This is a 4-way, signalized intersection with Park Road and Park Street running east-west and Prospect Avenue running north-south. The Town of West Hartford is located to the west of this intersection. The City of Hartford is located to the east of this intersection. The posted speed limit on all four legs of this intersection is 30 miles per hour. The Park Road eastbound approach is two lanes wide with one combination left/through lane and one combination through/right lane. The Park Street westbound approach is two lanes wide with one dedicated left-turn lane and one combination through/right lane. The Prospect Avenue northbound and southbound approaches are both two lanes wide with one combination left/through lane and one combination through/right lane. There are crosswalks across all four legs of this intersection. The traffic control signal at this intersection operates to provide five phases: the first is a Park Street westbound only phase to facilitate the left turns onto Prospect Avenue; followed by a Park Road eastbound and Park Street westbound phase for all movements; followed by an exclusive pedestrian phase when actuated; followed by a Prospect Avenue northbound only phase to facilitate the left turns onto Park Road; followed by a Prospect Avenue northbound and southbound phase for all movements.

- Prospect Avenue at Proposed East Site Drive:

  This will be a 3-way, unsignalized intersection with Prospect Avenue running north-south and the proposed East Site Drive as the west leg of the intersection. The Prospect Avenue northbound and southbound approaches to this intersection will each remain two lanes wide. The Proposed East Site Drive will have one inbound and two outbound lanes separated by a raised median, and the two outbound lanes will be controlled by a Stop sign.

Existing and Background Traffic Volumes

For the purpose of establishing existing and background traffic volumes for the subject study area, manual turning movement counts were conducted in the subject study area during the peak hours associated with the arrivals and departures for the proposed residential development. These peak hour periods were assumed to fall between 7:00 and 9:00 am for the weekday morning peak, and between 4:00 and 6:00 pm for the weekday evening peak. These counts were conducted on Monday, November 17, 2014.

Please refer to Exhibits 3 and 4 of the Appendix which graphically summarize the 2014 existing am and pm peak hour traffic volumes, respectively, that were measured for the subject study area.

Please refer to Exhibits 5 and 6 of the Appendix which graphically summarize the projected 2017 am and pm peak hour traffic volumes, respectively, for the subject study area, wherein all traffic volumes were increased by a 2 percent per year annual growth factor applied over 3 years to represent no-build conditions prior to the introduction of the new residential development.

Site-Generated Traffic Volumes and Distributions

For the purpose of estimating the likely trip distribution patterns for site-generated traffic traveling to and from the proposed residential development during the weekday commuter am and pm peak periods, we utilized the journey-to-work data made available in Town Profiles by the Department of Economic and Community Development (CT DECD) for each of the towns in Connecticut.

Please refer to Table A on the next page of this study which summarizes the journey-to-work patterns for residents of the Town of West Hartford, where it has been assumed that the new residents of the subject facility will also follow the same patterns. Also contained in Table A are the estimated likely routes to be traveled to and from the subject development given its location with respect to the surrounding roadway network.

Please refer to Table A which shows the following likely site-generated traffic distribution pattern:

- To and from the North via Prospect Avenue: 35 percent
- To and from the south via Prospect Avenue: 30 percent
- To and from the West via Park Road: 20 percent
- To and from the east via Park Street: 15 percent

Please refer to Exhibits 7 and 8 of the Appendix which graphically summarize the estimated site-generated traffic distribution patterns for the subject study area.

For the purpose of estimating site-generated peak hour traffic volumes for the subject development, we utilized the trip generation equations from ITE's (Institute of Transportation Engineers) Trip Generation Manual. This universally recognized data source provide trip generation data for many land uses throughout the nation, wherein for residential apartment developments the independent variable is the number of existing and/or proposed apartment units.

Please refer to Exhibit 9 of the Appendix which provides trip generation calculations for both the existing 36 units that will be reserved for the Sisters of Saint Joseph's (see Exhibit 9A) and for the proposed 310 units that will be developed for the general public (see Exhibit 9B).

Please refer to Table B on the page following the next page of this study which summarizes the trip generation estimates for the subject proposal. A trip is defined as a one-way vehicular movement traveling either to or from the development.

Table A
Distribution of Town Residents Commuting for Employment FROM Town of West Hartford
Source: DECD Town Profiles, October 2014

West Hartford Resident Commuters To	Number	Percent of Total	Likely Routes to be Traveled: To/From North via Prospect Avenue	To/From South via Prospect Avenue	To/From West via Park Road	To/From East via Park Street
Hartford	7,687	40.0%	12.0%	14.0%		14.0%
West Hartford	4,789	24.9%	7.5%	8.7%	8.7%	
Farmington	1,846	9.6%		4.8%	4.8%	
East Hartford	1,038	5.4%	5.4%			
New Britain	925	4.8%		2.4%	2.4%	
Bloomfield	905	4.7%	4.7%			
Windsor	783	4.1%	4.1%			
Bristol	635	3.3%		1.7%	1.7%	
Manchester	609	3.2%	3.2%			
Total:	19,217	100%	36.8%	31.6%	17.6%	14.0%
		Call:	**35%**	**30%**	**20%**	**15%**

Bubaris Traffic Associates
October 2015

Table B
Trip Generation Estimates
Proposed Arcadia Crossing
Park Road at Prospect Avenue
West Hartford, Connecticut

	Existing Apartments (36 Units)	Proposed Apartments (310 Units)	Total Apartments (346 Units)
Weekday AM Peak			
In	5	30	35
Out	19	121	140
Total	24	151	175
Weekday PM Peak			
In	19	124	143
Out	11	70	81
Total	30	194	224

Bubaris Traffic Associates
October 2015

From Table B, it is estimated that the subject development will generate about 175 trips per hour during the weekday am peak hour, and about 224 trips per hour during the weekday pm peak hour.

Typically, there are two weekday am peak hours in the morning and two pm peak hours in the evening since the commuting traffic to and from a residential complex usually extend over two hours each depending on how far the places of employment are located from the place of residence.

Please refer to Exhibits 10 and 11 of the Appendix which graphically depict the estimated am and pm peak hour site-generated traffic volumes distributed throughout the subject study area based on the estimated trip distributions from Exhibits 7 and 8, applied to the estimated hourly trip generation estimates from Exhibit 9.

Operations Analysis

2014 existing weekday am and pm peak hour analyses for the existing development are based on the peak hour traffic volumes shown as Exhibits 3 and 4, respectively, of the Appendix.

2017 background (no-build) weekday am and pm peak hour analyses with only the existing development in place, 3 years hence, are based on the peak hour traffic volumes shown as Exhibits 5 and 6, respectively, of the Appendix.

2017 combined (build) weekday am and pm commuter peak hour analyses, representing conditions when the proposed new residential facility is in place, are based on the peak hour traffic volumes shown as Exhibits 12 and 13 of the Appendix, respectively. Exhibits 12 and 13 were developed by combining the background, no-build traffic volumes from Exhibits 5 and 6 with the estimated site-generated traffic volumes from Exhibits 10 and 11.

Intersection operational analyses were performed for the defined study intersections utilizing the methodology described in the latest edition of Highway Capacity Manual, Special Report 209, Transportation Research Board, 1985, updated to 2010. Application of this methodology was facilitated by use of Synchro Analysis Software, developed by the Trafficware Corporation, Version 8, 2013. Operational analyses are utilized to determine a Level of Service (LOS) for a given intersection operating under either signalized or unsignalized control.

In the case of signalized intersections similar to the signalized intersection of Park Road/Park Street at Prospect Avenue, Level of Service (LOS) is defined in terms of control delay, which is a measure of driver discomfort, frustration, increased fuel consumption, and lost of travel time. The delay experienced by a motorist is comprised of a number of factors that relate to control, geometric, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions in the absence of traffic control, geometric delay, any incidents, and

any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the volume-to-capacity (v/c) ratio for the lane group. In the case of signalized intersections, the

Level of Service for each approach is computed, and an overall Level of Service for the entire intersection is determined. In today's environment, Levels of Service C to D are considered acceptable, and Levels of Service A to B are seldom achieved at signalized intersections.

Please refer to Exhibit 14 in the Appendix, which provides details on the definitions of Levels of Service for signalized intersections.

In the case of unsignalized intersections similar to the majority of the study intersections, Level of Service (LOS) is defined in terms of the average control delay for the approach or movement evaluated. Control delay involves movements at slower speeds and stops on intersection approaches as vehicles move up in the queue or slow down upstream of an intersection. The delay experienced by a motorist is comprised of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference time that would result during base conditions in the absence of incident, control, traffic, or geometric delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. At two-way stop-controlled and all-way stop-controlled intersections, control delay is the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The control delay also includes the time required to decelerate to a stop and to accelerate to the free-flow speed. Level of Service for a one-way or two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a one-way or two-way stop-controlled intersection is **not defined** for the intersection as a whole. In today's environment, Levels of Service D to F are common and are often experienced on minor street approaches to major streets carrying relatively high traffic volumes.

Please refer to Exhibit 15 in the Appendix, which provides details on the definitions of Levels of Service for unsignalized intersections.

The results of the operational analyses, which compare 2014 existing, 2017 background (no-build), and 2017 combined (build) conditions, are summarized in Table C on the next page of this study.

Table C
Summary of Traffic Operations Analysis
Levels of Service
Proposed Arcadia Crossing
West Hartford, Connecticut

	Existing 2014		Background 2017		Combined 2017	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Park Road at South Highland Street						
Park Road eastbound left	LOS A	LOS A	LOS A	LOS A	LOS A	LOS A
South Highland Street southbound approach	LOS B	LOS B	LOS B	LOS B	LOS B	LOS C
Park Road at Ringgold Street						
Park Road westbound left	LOS A	LOS A	LOS A	LOS A	LOS A	LOS A
Ringgold Street northbound approach	LOS B	LOS B	LOS B	LOS B	LOS B	LOS B
Park Road at North Site Drive						
Park Road westbound (inbound) left	LOS A	LOS A	LOS A	LOS A	LOS A	LOS A
North Site Drive northbound (outbound) approach	LOS B	LOS B	LOS B	LOS B	LOS B	LOS B
Park Road at Prospect Avenue						
Park Road eastbound approach	LOS C	LOS C	LOS C	LOS C	LOS C	LOS C
Park Road westbound approach	LOS B	LOS C	LOS B	LOS C	LOS C	LOS C
Prospect Avenue northbound approach	LOS B	LOS B	LOS B	LOS B	LOS B	LOS C
Prospect Avenue southbound approach	LOS C	LOS C	LOS C	LOS C	LOS C	LOS C
- OVERALL -	- LOS C -	- LOS C -	- LOS C -	- LOS C -	- LOS C -	- LOS C -
Prospect Avenue East Site Drive						
Prospect Avenue northbound (inbound) left	---	---	---	---	LOS A	LOS A
East Site drive eastbound (outbound) approach	---	---	---	---	LOS B	LOS C

Bubaris Traffic Associates
October 2015

The computer-generated worksheets for these operational analyses are included as Exhibits 16 through 21of the Appendix as follows:

- Exhibit 16 – 2014 Existing AM Peak
- Exhibit 17 – 2014 Existing PM Peak
- Exhibit 18 – 2017 Background (no-build) AM Peak
- Exhibit 19 – 2017 Background (no-build) PM Peak
- Exhibit 20 – 2017 Combined (build) AM Peak
- Exhibit 21 – 2017 Combined (build) PM Peak

A review of Table C shows that levels of service in the year 2014 of existing traffic operations for the subject study intersections are very good to excellent levels of service A and B for all the unsignalized study intersections, and overall level of service C (considered good and average) for the signalized intersection of Park Road/Park Street at Prospect Avenue.

A review of Table C also shows that levels of service in the year 2017 of background (no-build) traffic operations for the subject study intersections continue at the same very good to excellent levels of service A and B for all the unsignalized study intersections, and overall level of service C (considered good and average) for the signalized intersection of Park Road/Park Street at Prospect Avenue.

Finally, a review of Table C also shows that levels of service in the year 2017 of combined (build) traffic operations for the subject study intersections, WITH the introduction of the new residential development, will continue to show essentially the same satisfactory levels of service A (excellent) to C (good) for all the study intersections, with only slight changes (i.e., change from LOS B to LOS C during the weekday pm peak for the South Highland Street southbound approach at Park Road) and for the Prospect Avenue northbound approach at Park Road/Park Street. Additionally, the new East Site Drive will operate at levels of service A (considered excellent) to C (considered good) during the two commuter peaks.

Therefore, the proposed new Arcadia Crossing residential development should not have an adverse impact on traffic operations that would otherwise exist within the defined study area without the subject development.

Sight Line Analysis

A review was made of available sight line distances to and from both the North and East Site Drive locations and, although not measured, found to be satisfactory for the posted speed limits of 30 miles per hour on both streets which usually suggests 85th percentile speeds of 40 miles per hour and sight line requirement of 445 feet.

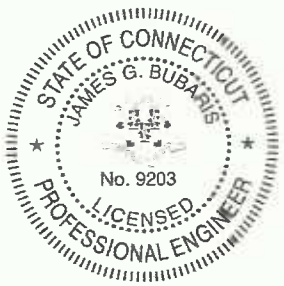
Conclusions

It is the professional opinion of Bubaris Traffic Associates that the proposed Arcadia Crossing residential development, to be located at the southwest quadrant of the intersection of Park Road/Park Street at Prospect Avenue, on the site of the existing Sisters of Saint Joseph facility, in the Town of West Hartford, should not adversely impact traffic operations on the surrounding roadway network in the year 2017 when full occupancy of the subject development is expected.

Operational analyses indicate that the proposed development will essentially not alter the satisfactory levels of service that would otherwise be in place without the introduction of the new subject residential facility.

Improvements in either geometrics or traffic control are not deemed necessary to accommodate the anticipated site-generated traffic volumes to be added to the surrounding roadway network by the proposed development.

Available sight lines from the proposed site drive locations on Park Road and at Prospect Avenue appear to be satisfactory from field views conducted in the study area.



Very truly yours,
Bubaris Traffic Associates

James G. Bubaris

James G. Bubaris, P.E.
Conn. Reg. No. 9203
Principal

Cc:

Mr. Andrew J. Krar, P.E.
Design Professionals, Inc.
21 Jeffrey Drive
South Windsor, CT 06074

Site Traffic Evaluation Study
Proposed Arcadia Crossing
Prospect Avenue at Park Road
West Hartford, Connecticut

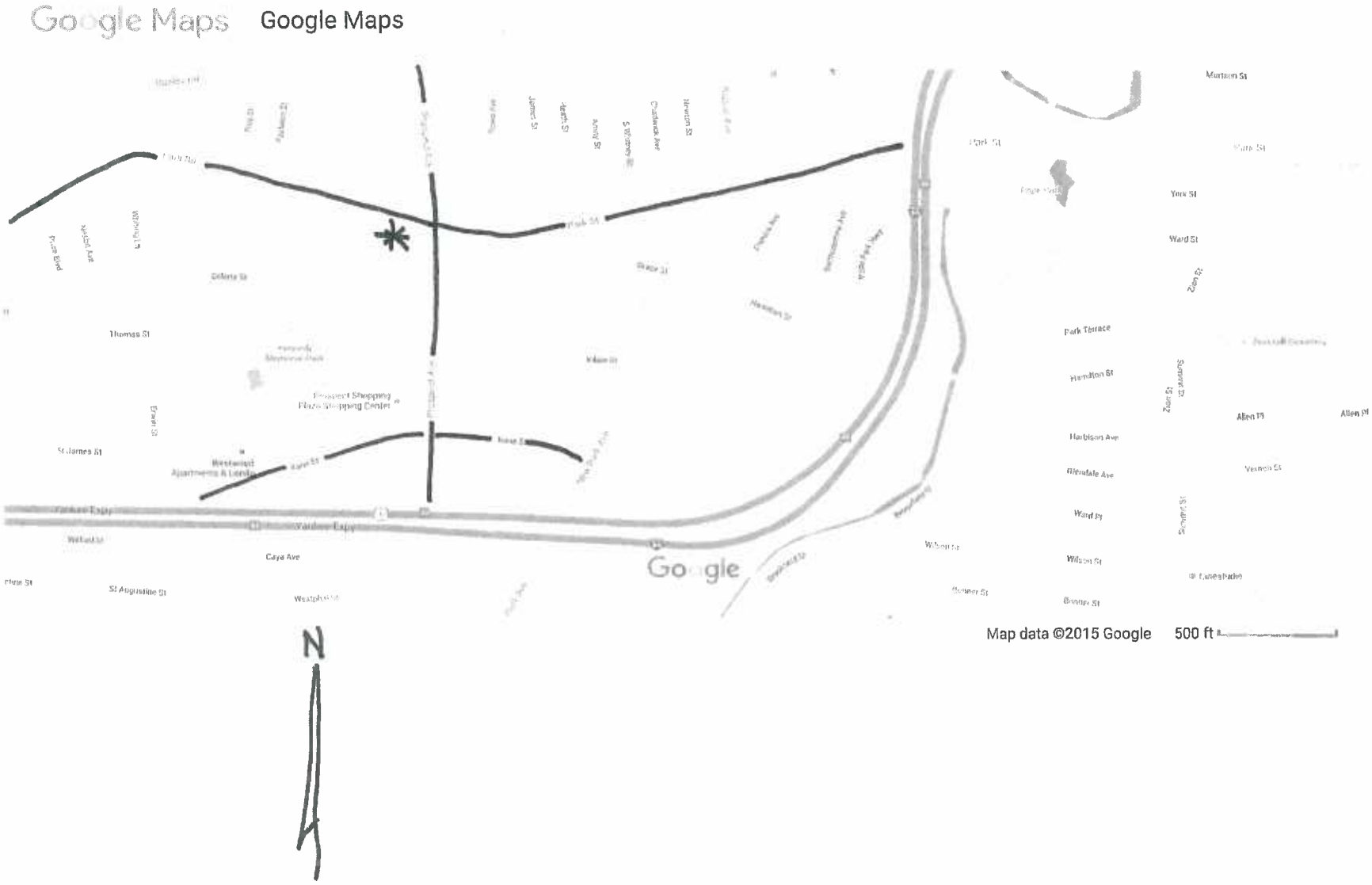
Appendix

Table of Contents

(continued)

(continued)

Exhibit 1
Location Maps


Google Maps
Google Maps
Thomas St
St James St
Caya Ave
St Augustine St
Park Terrace
Hamilton St
Harbison Ave
Glendale Ave
Ward Pl
Wilson St
Brainerd St
York St
Ward St
Allen Pl
Vernon St
Wilson Ave
Google
Map data ©2015 Google
500 ft
N


Google Maps
Park Rd
Park St
Existing Site
N
Google
Map data ©2015 Google
100 ft

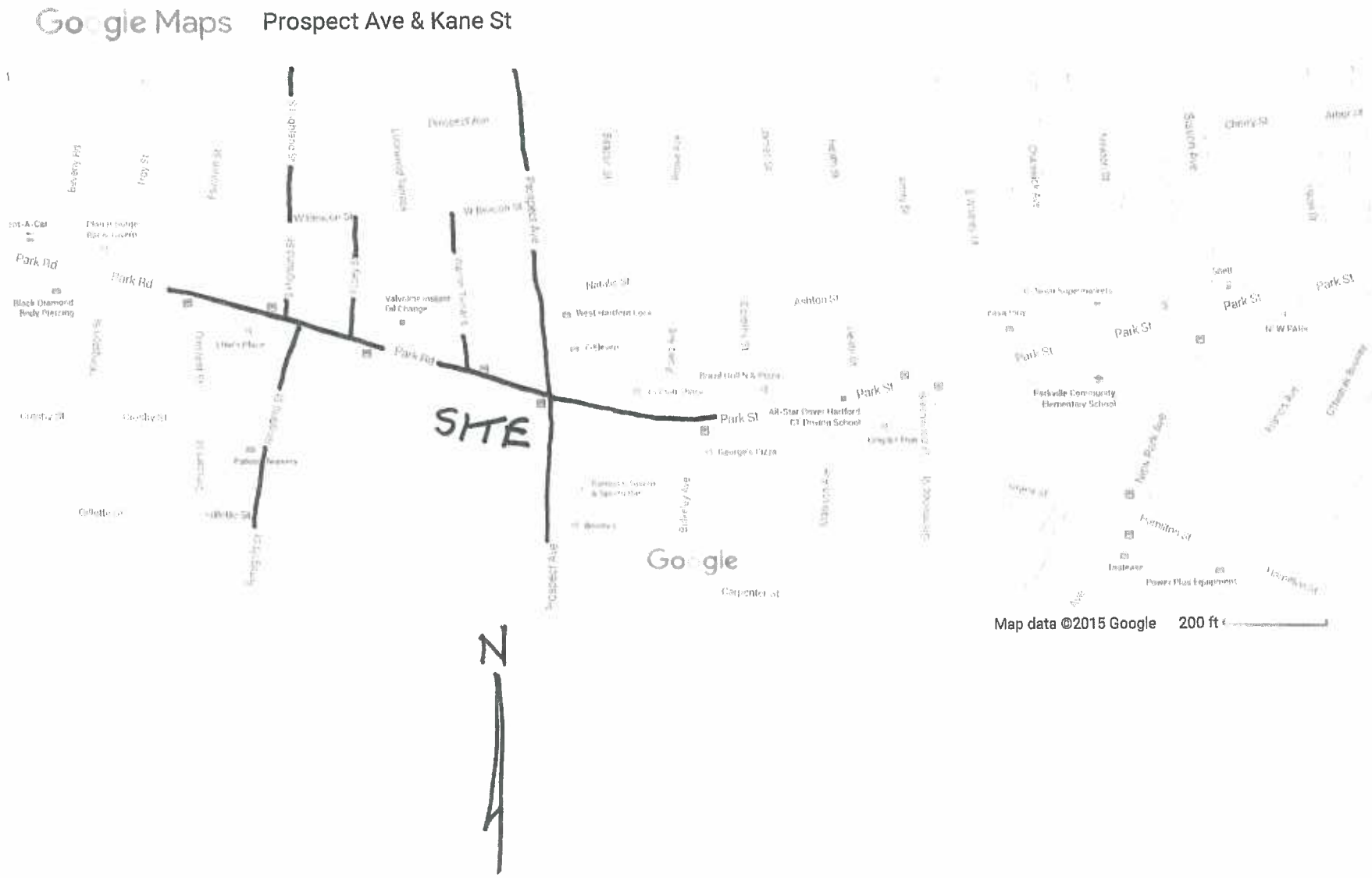
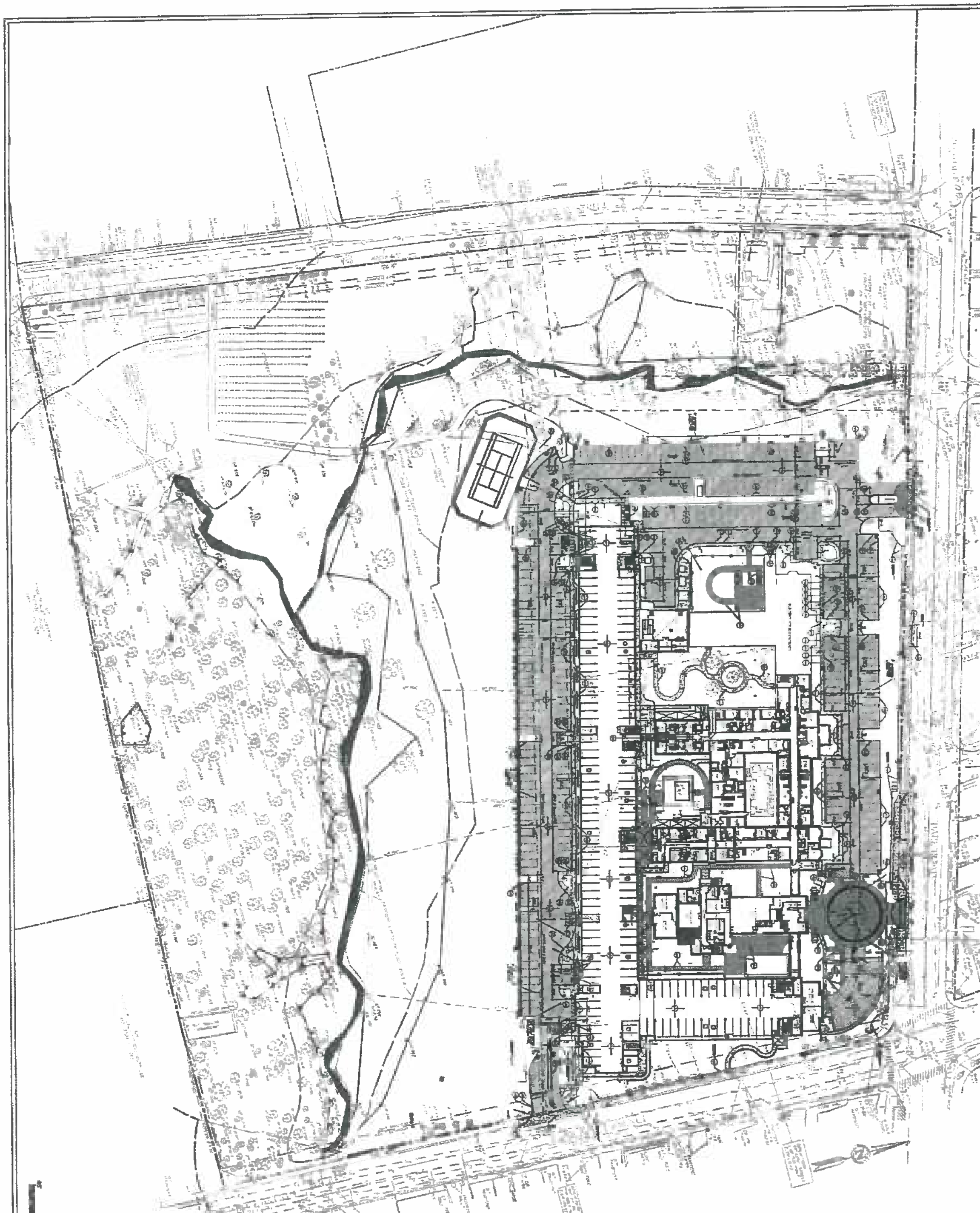

Google Maps
Prospect Ave & Kane St
Park Rd
Park St
SITE
N
Google
Map data ©2015 Google
200 ft

Exhibit 2
Site Plan



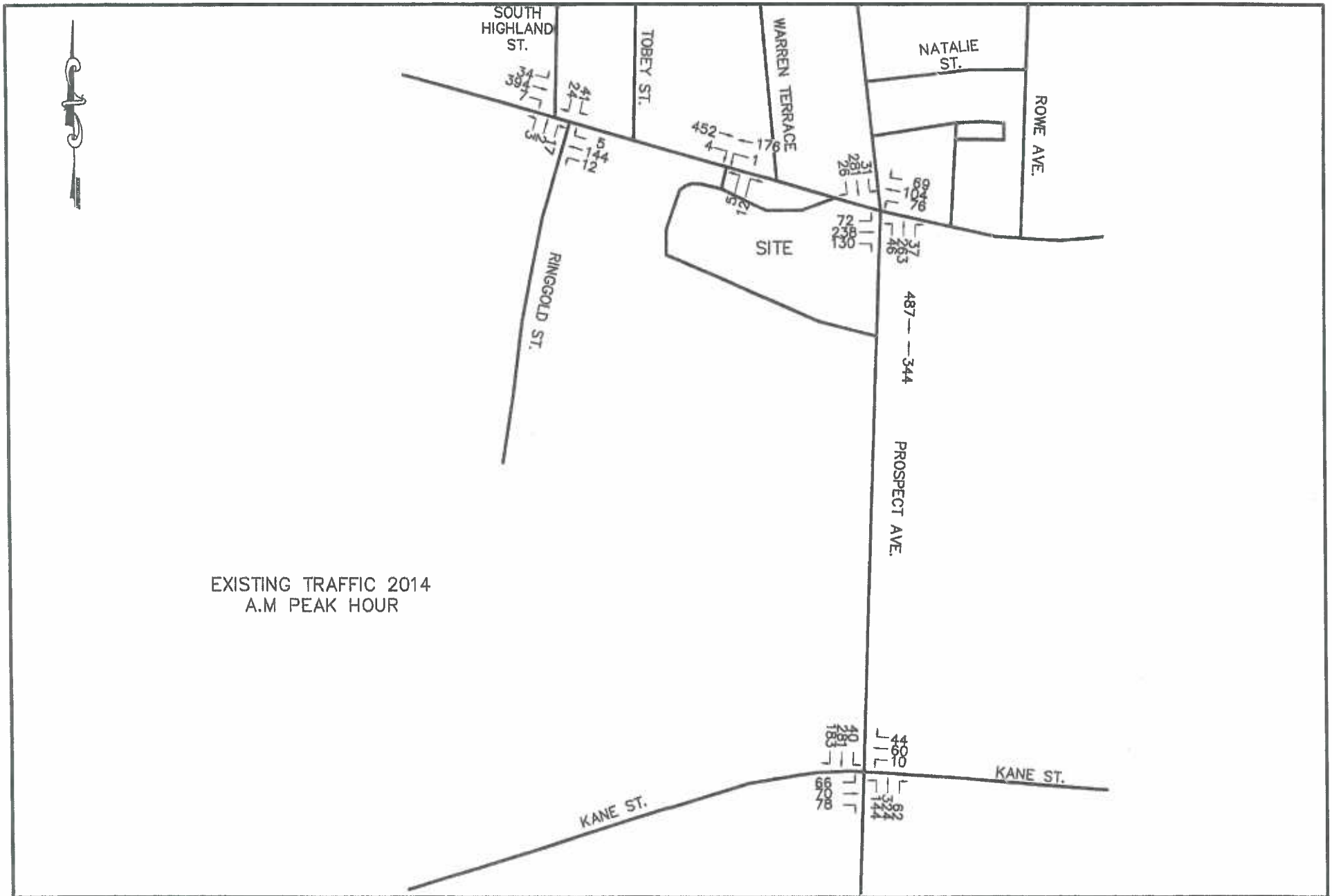
ARCADIA CROSSING

One Park Road,
West Hartford, , CT

NCA

REVISIONS:

PROGRESS SET
NOT FOR CONSTRUCTION



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ARCADIA CROSSING
PROSPECT AVE & PARK RD
WEST HARTFORD CONNECTICUT

EXHIBIT 3

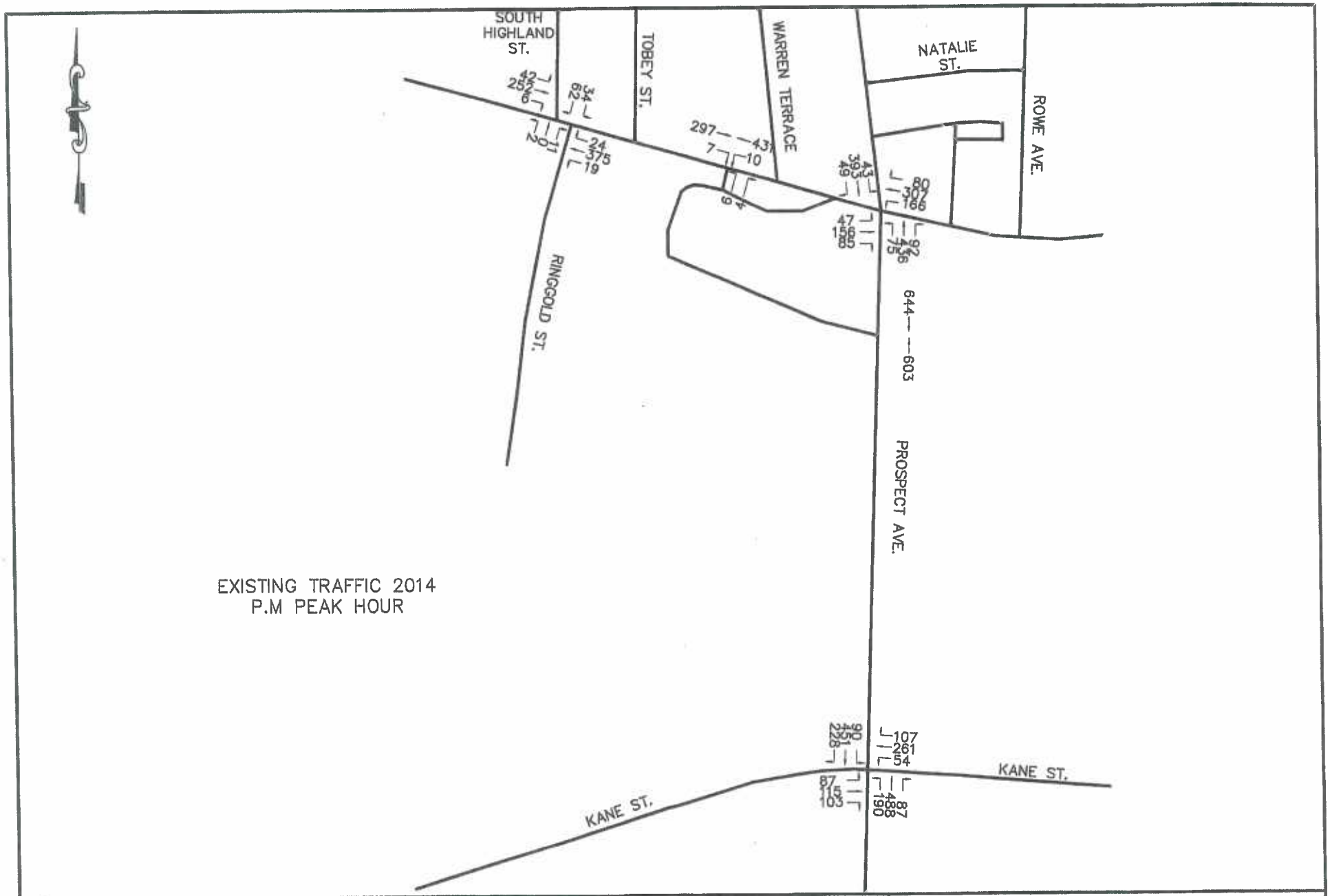

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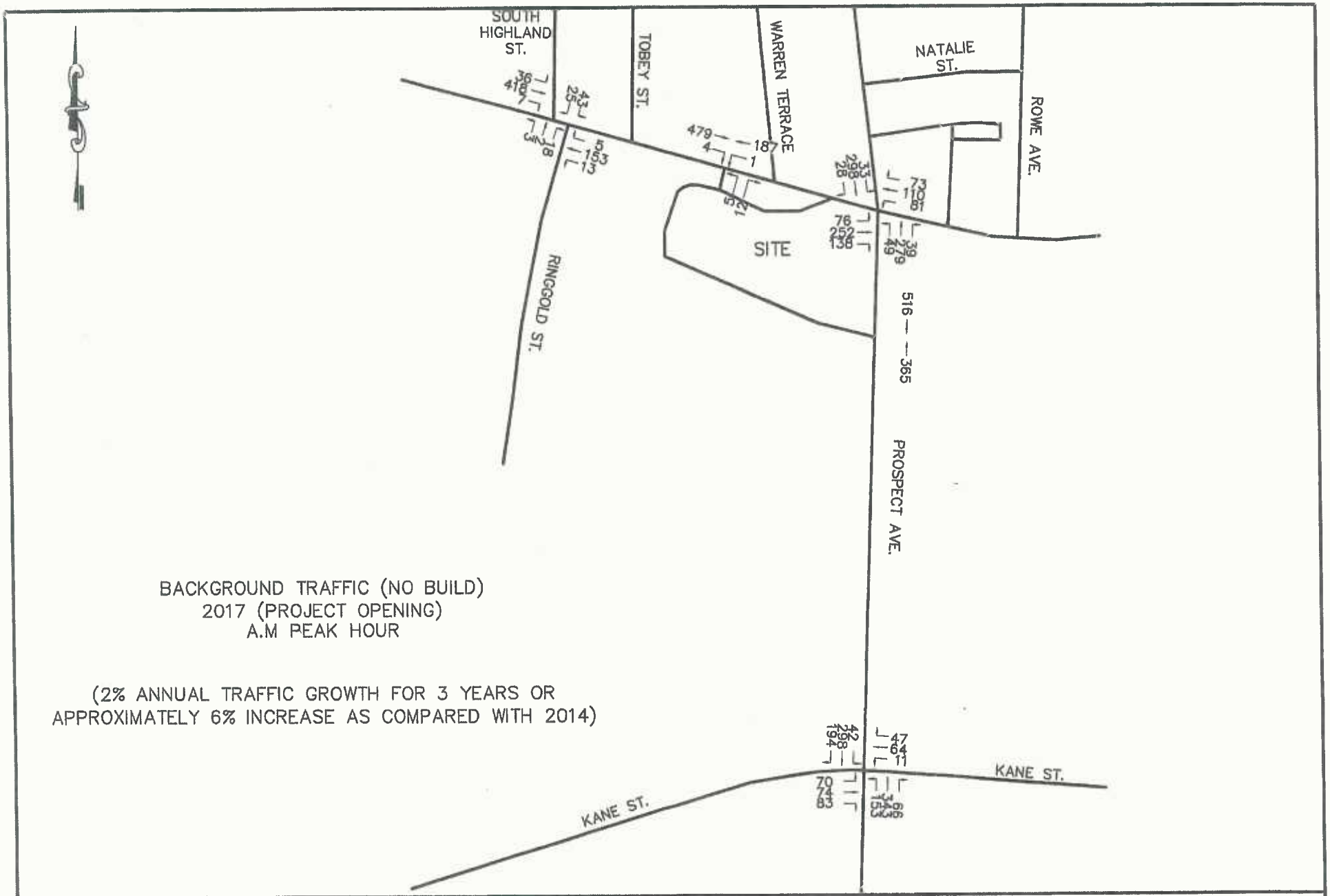
EXHIBIT 4



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Tel. 860-291-9755
Fax 860-291-9757

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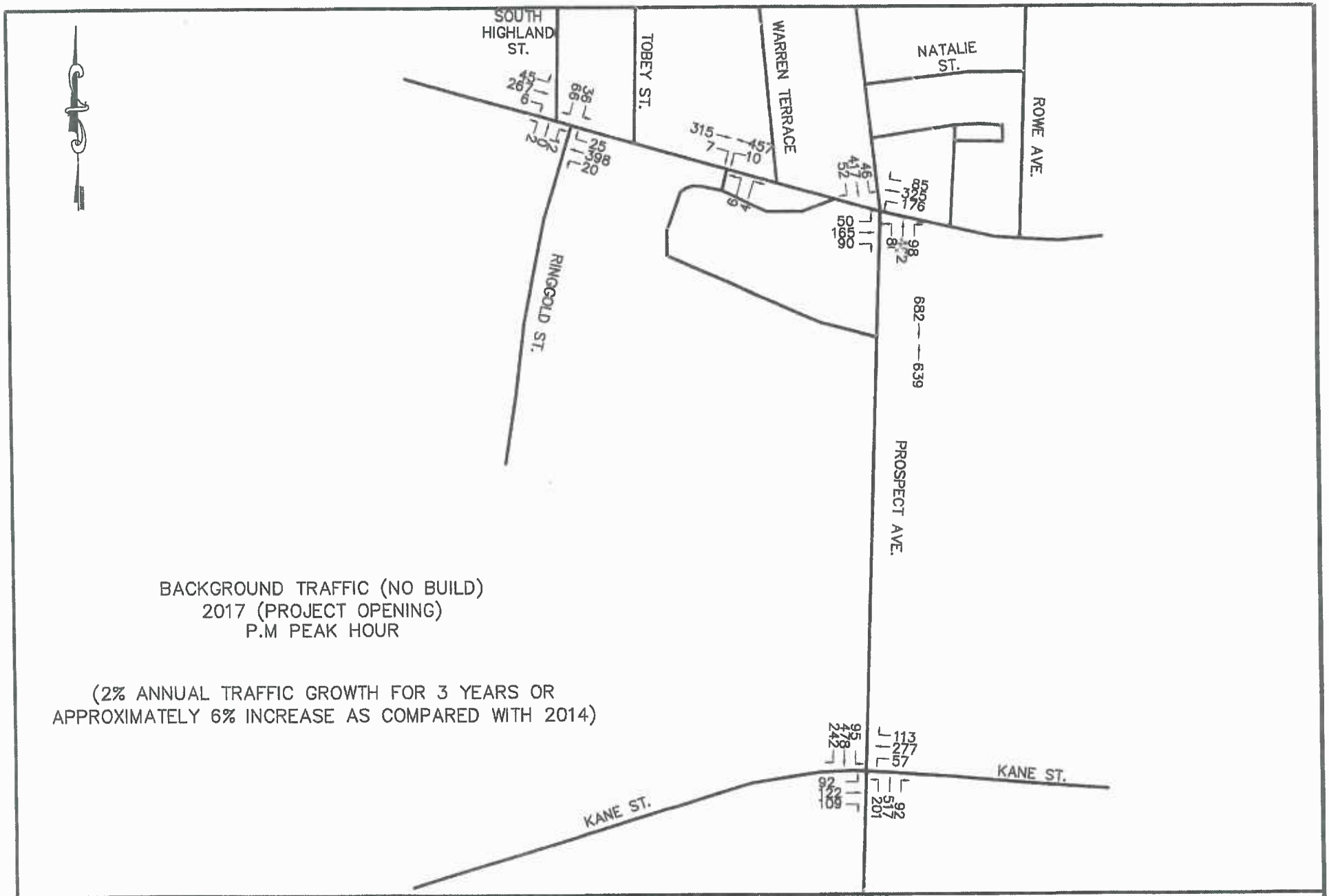
EXHIBIT 5



BACKGROUND TRAFFIC (NO BUILD)
2017 (PROJECT OPENING)
P.M PEAK HOUR

(2% ANNUAL TRAFFIC GROWTH FOR 3 YEARS OR APPROXIMATELY 6% INCREASE AS COMPARED WITH 2014)

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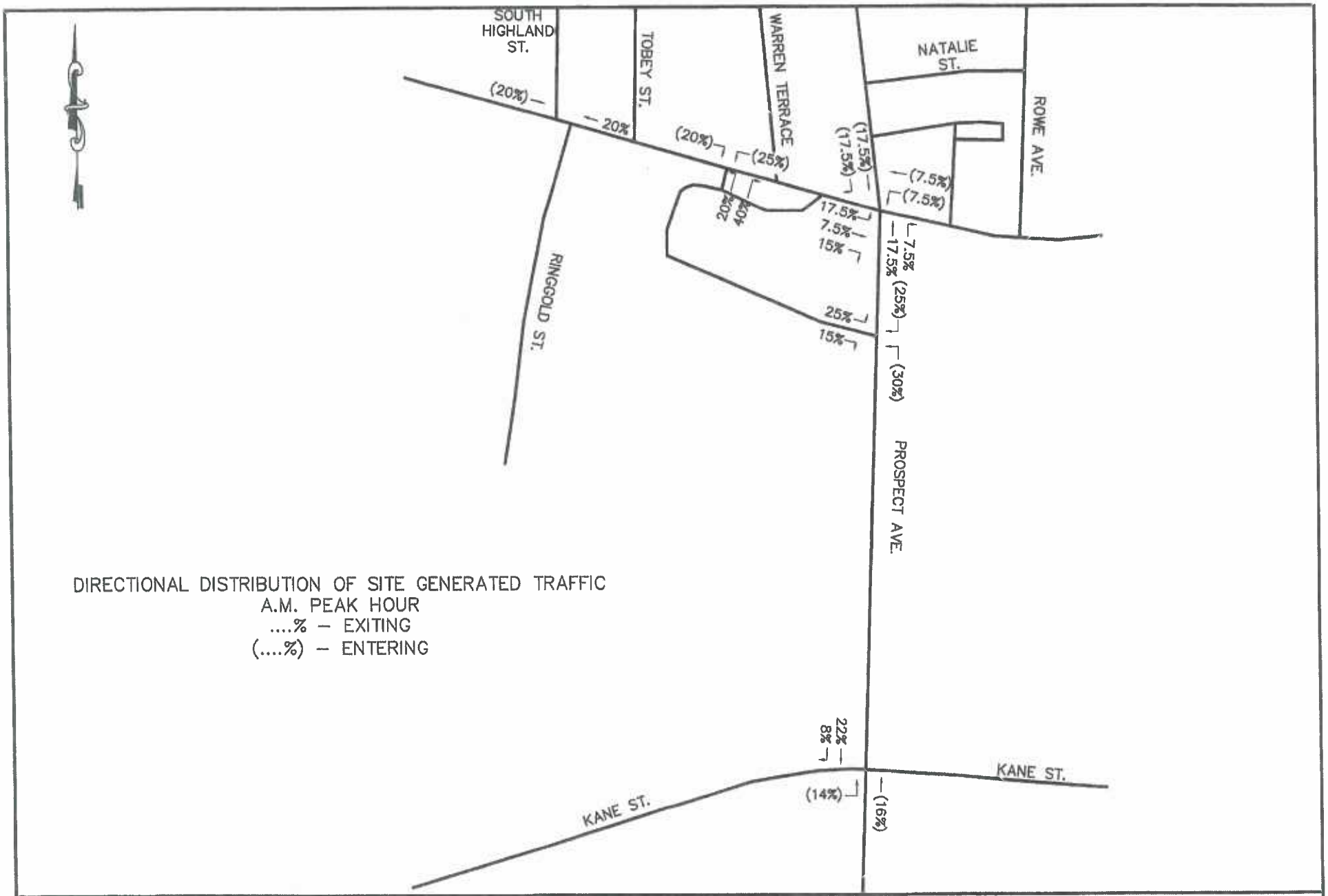
EXHIBIT 6



DIRECTIONAL DISTRIBUTION OF SITE GENERATED TRAFFIC
A.M. PEAK HOUR
....% – EXITING
(....%) – ENTERING

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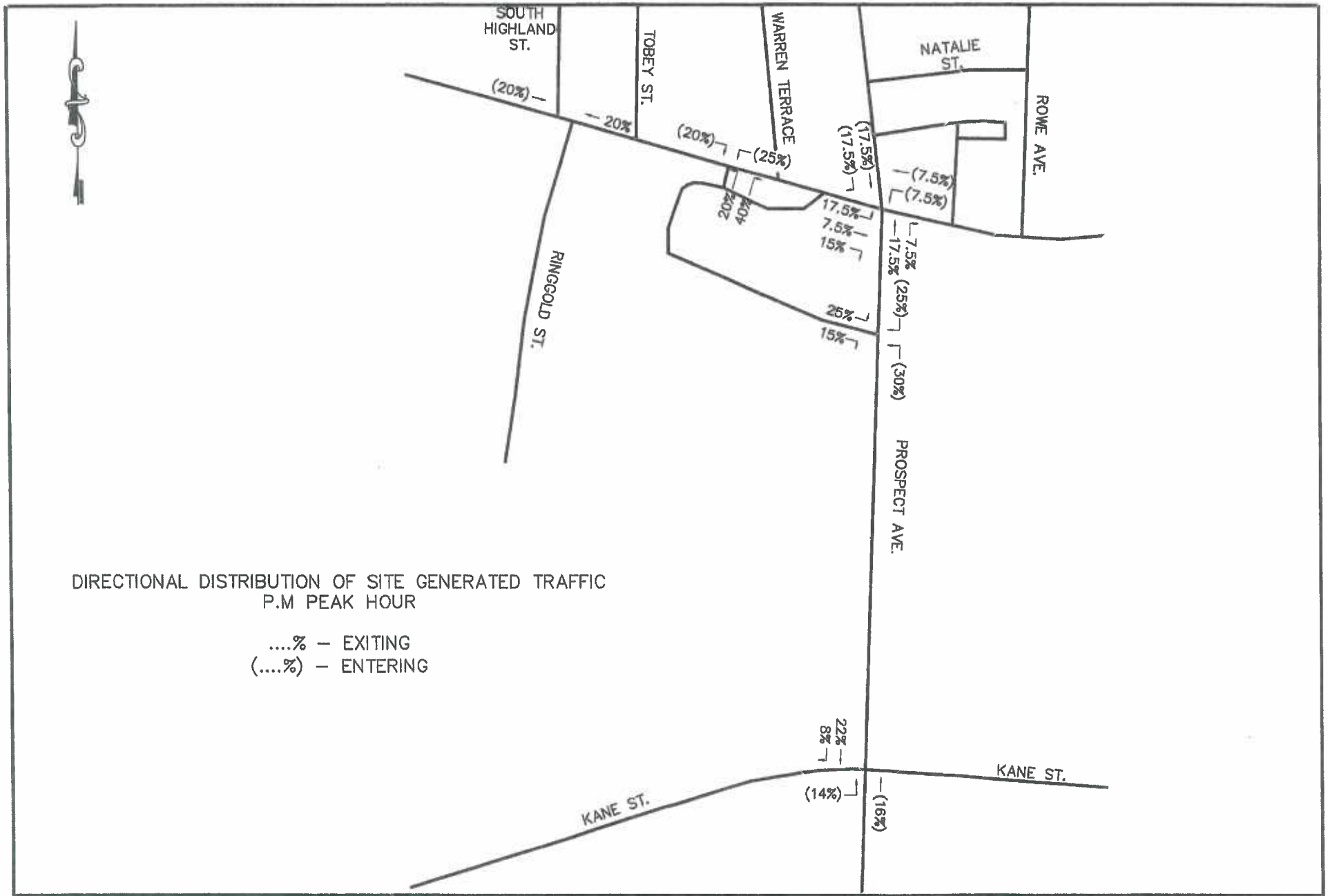
EXHIBIT 7



DIRECTIONAL DISTRIBUTION OF SITE GENERATED TRAFFIC
P.M PEAK HOUR

....% – EXITING
(....%) – ENTERING

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PROSPECT AVE & PARK RD
WEST HARTFORD CONNECTICUT

EXHIBIT 8

Exhibit 9
Trip Generation Estimates for Apartments

9/27/2015

APARTMENTS-LOW RISE*
(2012)

Exhibit 9A

SUMMARY OF TRIP GENERATION CALCULATIONS

SOURCE: TRIP GENERATION REPORT, INSTITUTE OF TRANSPORTATION ENGINEERS, 9th Edition, 2012

LAND USE: APARTMENTS--CODE #2: MENTS--CODE #221

PROJECT: **Arcadia Crossing, Existing Units**
West Hartford, Connecticut

NUMBER OF APARTMENT DWELLING UNITS: 36

TIME PERIOD	ITE TRIP GENERATION EQUATION	TOTAL TRIPS	INBOUND	OUTBOUND
AVERAGE WEEKDAY	T = 6.59 (X) 50 % INBOUND * 50 % OUTBOUND	241	120	120
PEAK HOUR 7 TO 9 AM	LN (T) = 0.82 LN (X) + 0.23 21 % INBOUND * 79 % OUTBOUND	24	5	19
PEAK HOUR 4 TO 6 PM	LN (T) = 0.88 LN (X) + 0.16 65 % INBOUND * 35 % OUTBOUND	27	18	10
WEEKDAY AM PEAK HOUR OF GENERATOR	LN (T) = .85 LN (X) + 0.14 20 % INBOUND * 80 % OUTBOUND	24	5	19
WEEKDAY PM PEAK HOUR OF GENERATOR	LN (T) = 0.86 LN (X) + 0.33 64 % INBOUND * 36 % OUTBOUND	30	19	11
AVERAGE SATURDAY	LN (T) = 0.91 LN (X) + 2.44 50 % INBOUND * 50 % OUTBOUND	299	150	150
SATURDAY PEAK HOUR OF GENERATOR	LN (T) = .82 LN (X) + 0.41 54 % INBOUND * 46 % OUTBOUND	28	15	13
AVERAGE SUNDAY	LN (T) = 0.92 LN (X) + 2.23 50 % INBOUND * 50 % OUTBOUND	251	126	126
SUNDAY PEAK HOUR OF GENERATOR	LN (T) = 0.79 LN (X) + 0.53 53 % INBOUND * 47 % OUTBOUND	29	15	14

APARTMENTS-LOW RISE*
(2012)

Exhibit 9B

SUMMARY OF TRIP GENERATION CALCULATIONS

SOURCE: TRIP GENERATION REPORT, INSTITUTE OF TRANSPORTATION ENGINEERS, 9th Edition, 2012

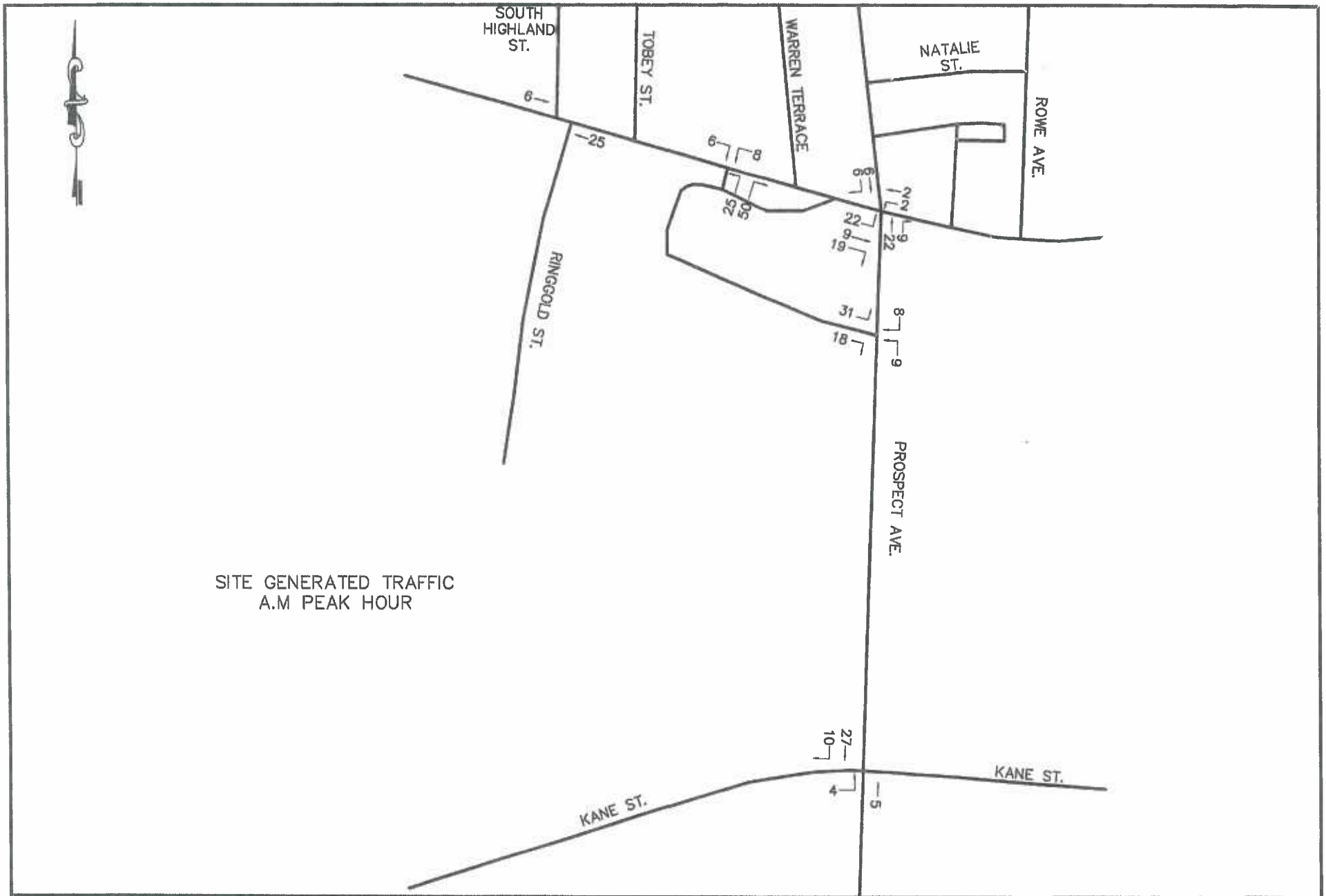
LAND USE: APARTMENTS–CODE #2: MENTS–CODE #221

PROJECT: **Arcadia Crossing, Proposed Units**

West Hartford, Connecticut

NUMBER OF APARTMENT DWELLING UNITS: 310

TIME PERIOD	ITE TRIP GENERATION EQUATION	TOTAL TRIPS	INBOUND	OUTBOUND
AVERAGE WEEKDAY	T = 6.59 (X) 50 % INBOUND * 50 % OUTBOUND	2074	1037	1037
PEAK HOUR 7 TO 9 AM	LN (T) = 0.82 LN (X) + 0.23 21 % INBOUND * 79 % OUTBOUND	139	29	110
PEAK HOUR 4 TO 6 PM	LN (T) = 0.88 LN (X) + 0.16 65 % INBOUND * 35 % OUTBOUND	183	119	64
WEEKDAY AM PEAK HOUR OF GENERATOR	LN (T) = .85 LN (X) + 0.14 20 % INBOUND * 80 % OUTBOUND	151	30	121
WEEKDAY PM PEAK HOUR OF GENERATOR	LN (T) = 0.86 LN (X) + 0.33 64 % INBOUND * 36 % OUTBOUND	193	124	70
AVERAGE SATURDAY	LN (T) = 0.91 LN (X) + 2.44 50 % INBOUND * 50 % OUTBOUND	2122	1061	1061
SATURDAY PEAK HOUR OF GENERATOR	LN (T) = .82 LN (X) + 0.41 54 % INBOUND * 46 % OUTBOUND	166	90	77
AVERAGE SUNDAY	LN (T) = 0.92 LN (X) + 2.23 50 % INBOUND * 50 % OUTBOUND	1822	911	911
SUNDAY PEAK HOUR OF GENERATOR	LN (T) = 0.79 LN (X) + 0.53 53 % INBOUND * 47 % OUTBOUND	158	84	74



Design Professionals
civil & traffic engineers • surveyors
landscape architects • planners • gis • gps
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ARCADIA CROSSING
PROSPECT AVE & PARK RD
WEST HARTFORD CONNECTICUT

FIGURE 10

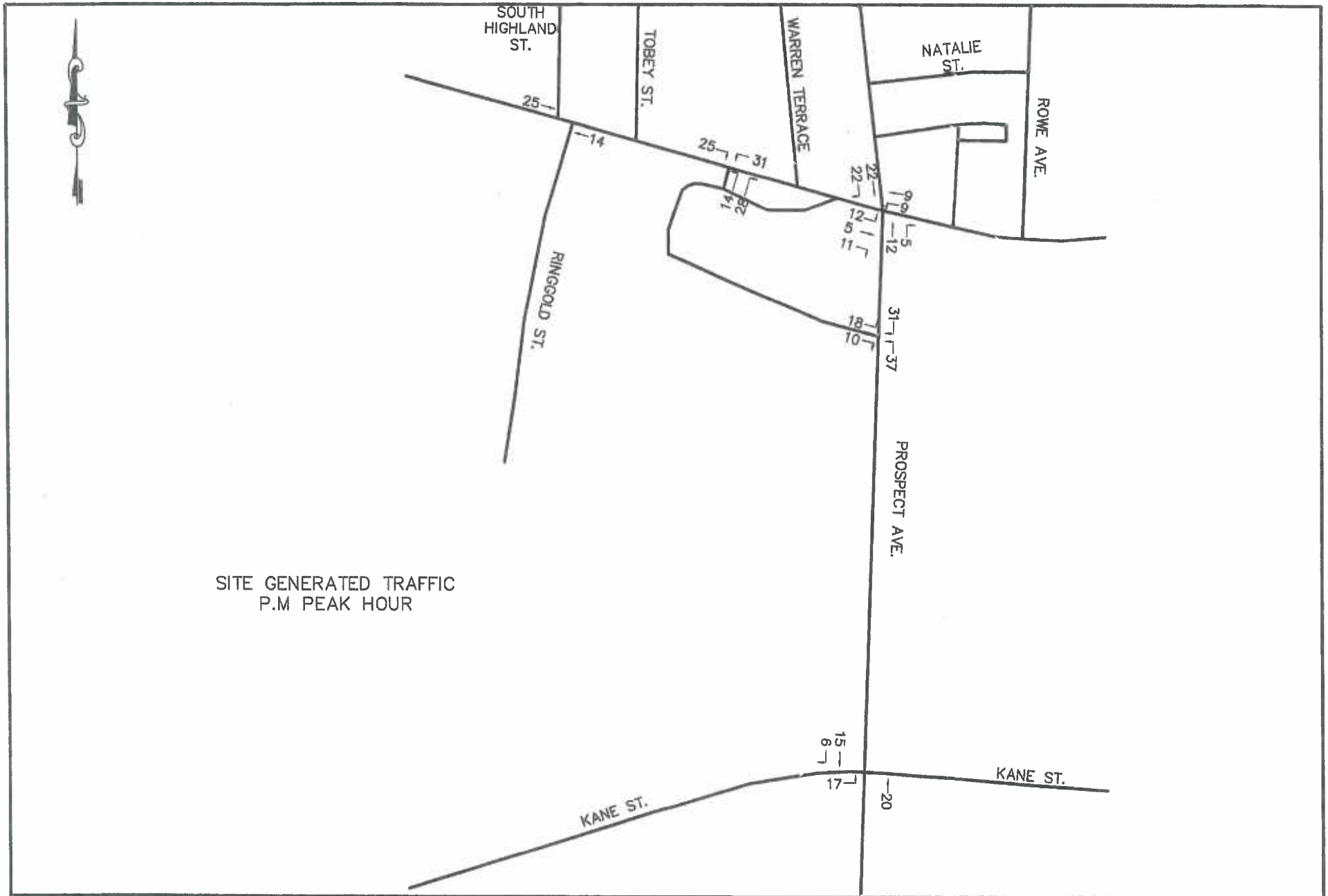

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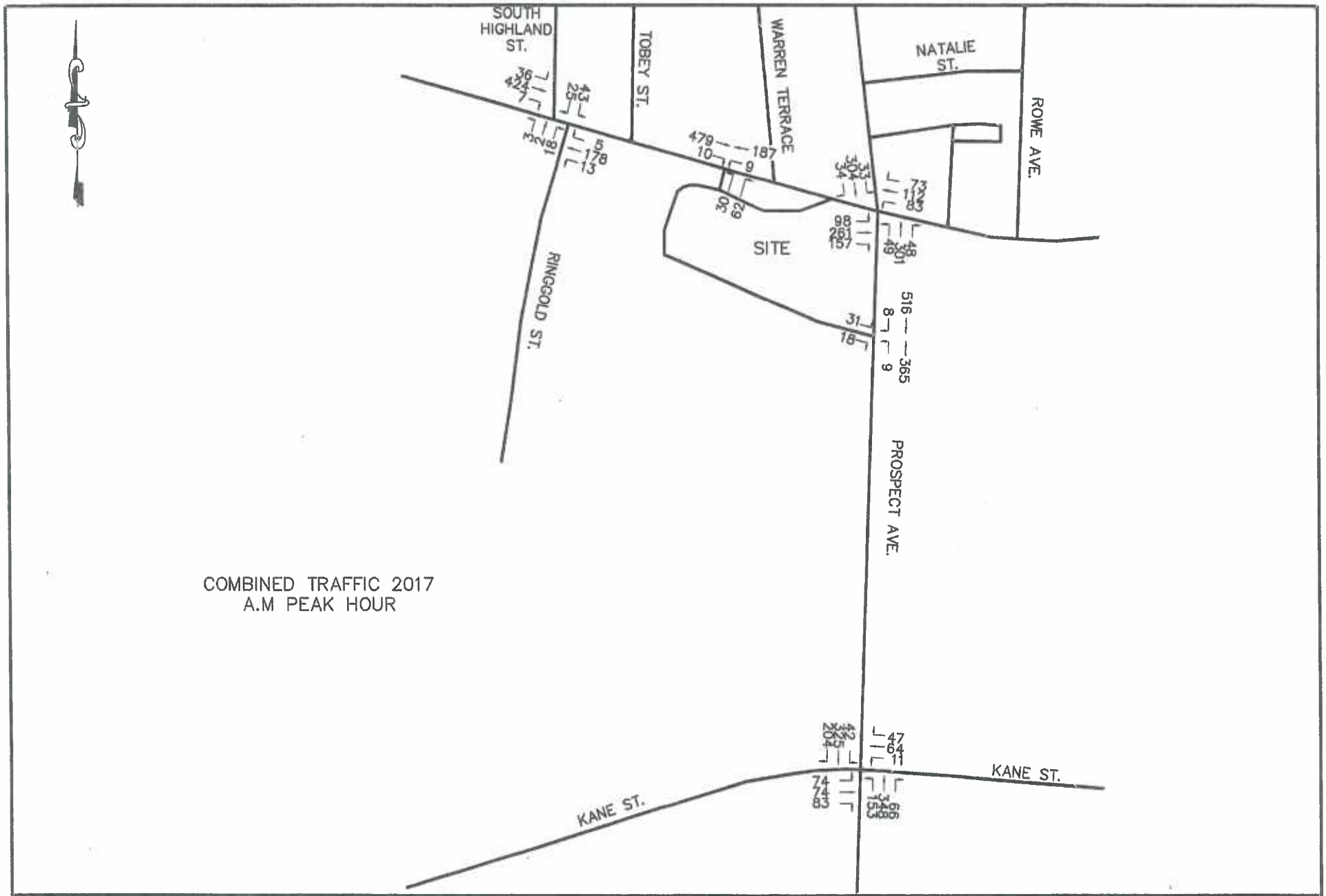
FIGURE 11



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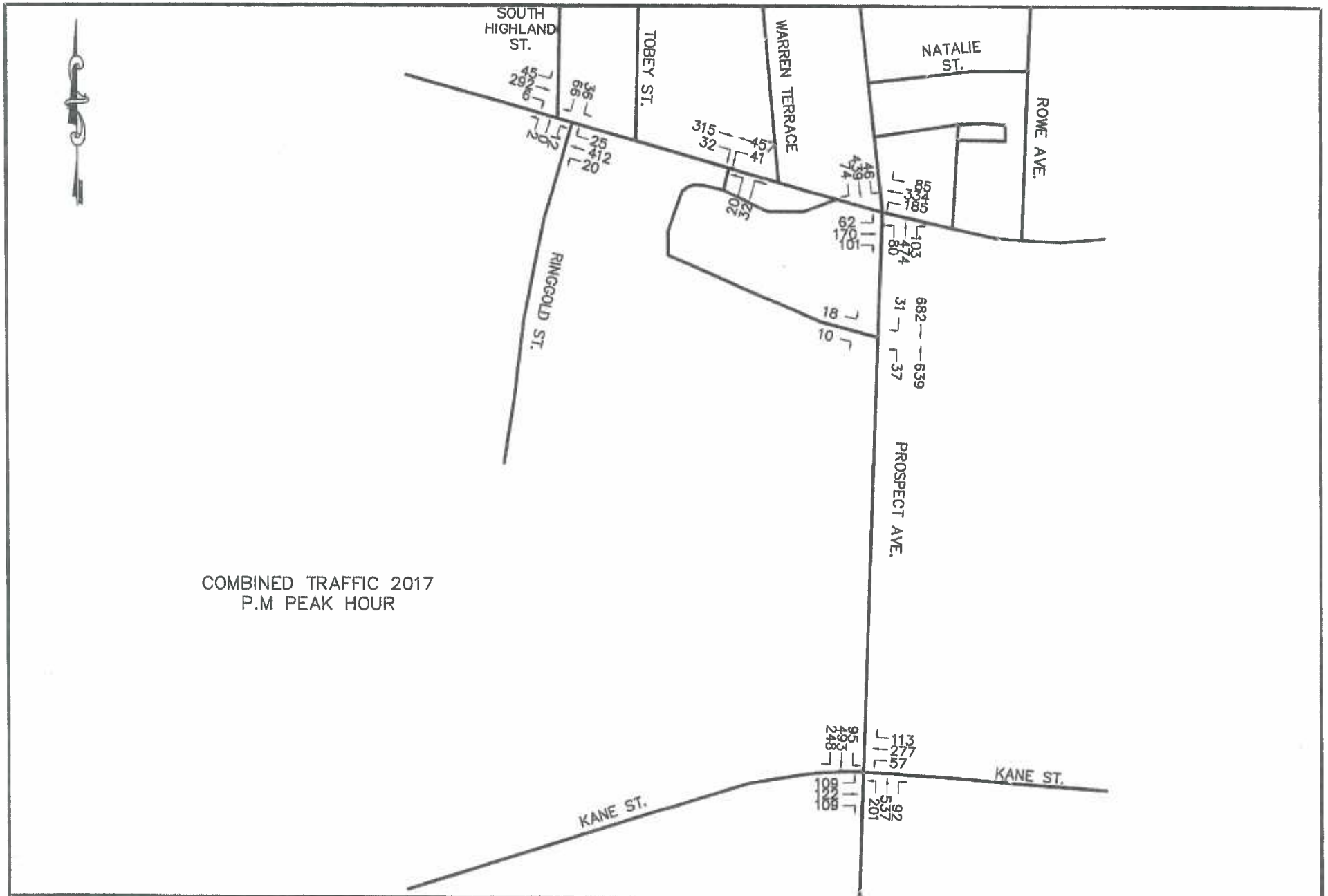
ARCADIA CROSSING
PROSPECT AVE & PARK RD
WEST HARTFORD CONNECTICUT

FIGURE 12



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ARCADIA CROSSING
PROSPECT AVE & PARK RD
WEST HARTFORD CONNECTICUT

FIGURE 13

EXHIBIT 14
LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

SOURCE: HIGHWAY CAPACITY MANUAL (HCM), 2010
TRANSPORTATION RESEARCH BOARD (1)

Level of Service for **signalized intersections** is defined in terms of control delay, which is a measure of driver discomfort, frustration, increased fuel consumption, and lost travel time. The delay experienced by a motorist is comprised of a number of factors that relate to control, geometric, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the volume-to-capacity (v/c) ratio for the lane group.

In the case of **signalized intersections**, the Level of Service for each approach is computed, and an overall Level of Service for the entire intersection is determined.

Levels of Service (LOS) for **signalized intersections** are defined as follows:

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SECONDS)	CONDITION
LOS A	≤ 10	LOW DELAY
LOS B	> 10 TO 20	SHORT DELAY
LOS C	> 20 TO 35	AVERAGE DELAY
LOS D	> 35 TO 55	CONGESTION NOTICEABLE
LOS E	> 55 TO 80	LIMIT OF ACCEPTABLE DELAY
LOS F	> 80	UNACCEPTABLE

In today's environment, Levels of Service C to D are considered acceptable, and Levels of Service A to B are seldomly achieved at signalized intersections.

(1) **HCM**, Exhibit 16-2.

EXHIBIT 15
LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTIONS

SOURCE: HIGHWAY CAPACITY MANUAL (HCM), 2010
TRANSPORTATION RESEARCH BOARD (1)

Level of Service for **unsignalized intersections** similar to the study intersections is defined in terms of the average control delay for the approach or movement evaluated. Control delay involves movements at slower speeds and stops on intersection approaches as vehicles move up in the queue or slow down upstream of an intersection.

The delay experienced by a motorist is comprised of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference time that would result during base conditions in the absence of incident, control, traffic, or geometric delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

At two-way stop-controlled and all-way stop-controlled intersections, control delay is the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The control delay also includes the time required to decelerate to a stop and to accelerate to the free-flow speed.

Level of Service (LOS) for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is **not defined** for the intersection as a whole.

Level of Service (LOS) for an all-way stop-controlled intersection is determined by the computed or measured control delay and is defined for all movements. A LOS **is then defined** for the intersection as a whole.

Levels of Service (LOS) for **unsignalized intersections** are defined as follows:

LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	CONDITION
LOS A	0 TO 10	LITTLE OR NO DELAY
LOS B	> 10 TO 15	SHORT DELAY
LOS C	> 15 TO 25	AVERAGE DELAY
LOS D	> 25 TO 35	LONG DELAY
LOS E	> 35 TO 50	VERY LONG DELAY
LOS F	> 50	EXTREME DELAY

In today's environment, Levels of Service D to F are common and are often experienced on minor street approaches to major streets carrying relatively high traffic volumes.

(1) **HCM**, Exhibits 17-2 and 17-22.

Exhibit 16
Traffic Operations Analysis Worksheets
Existing 2014 AM Peak

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	34	401	147	5	41	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	405	155	5	46	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	631	157
Stage 1	-	-	-	-	157	-
Stage 2	-	-	-	-	474	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1419	-	-	-	445	889
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	431	889
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6		12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	532
HCM Lane V/C Ratio	0.024	-	-	-	0.136
HCM Control Delay (s)	7.6	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	435	7	12	149	5	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	439	7	13	157	8	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	446	0	625	443
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1114	-	449	615
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1114	-	443	615
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	838	-

Approach	EB	WB	NB
HCM Control Delay, s		0.6	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	565	-	-	1114	-
HCM Lane V/C Ratio	0.064	-	-	0.011	-
HCM Control Delay (s)	11.8	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	452	4	1	176	5	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	457	4	1	178	5	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	461	0	639	459
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	180	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1100	-	440	602
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1100	-	440	602
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	850	-

Approach	EB	WB	NB
HCM Control Delay, s		0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	543	-	-	1100	-
HCM Lane V/C Ratio	0.034	-	-	0.001	-
HCM Control Delay (s)	11.9	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	238	130	76	104	69	46	263	37	31	281	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.940			0.984			0.988	
Flt Protected		0.989		0.950				0.993			0.995	
Satd. Flow (prot)	0	3500	1583	1770	1751	0	0	3458	0	0	3479	0
Flt Permitted		0.835		0.950				0.892			0.874	
Satd. Flow (perm)	0	2947	1583	1736	1751	0	0	3102	0	0	3053	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140		41			14			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	77	256	140	77	105	70	52	296	42	32	293	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	333	140	77	175	0	0	390	0	0	352	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	23.0	23.0	23.0	12.0	12.0		9.0	9.0		22.0	22.0	
Total Split (%)	25.6%	25.6%	25.6%	13.3%	13.3%		10.0%	10.0%		24.4%	24.4%	
Maximum Green (s)	17.0	17.0	17.0	9.0	9.0		6.0	6.0		16.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		13.8	13.8	8.1	28.1			22.7			13.3	
Actuated g/C Ratio		0.22	0.22	0.13	0.44			0.36			0.21	
v/c Ratio		0.52	0.31	0.34	0.22			0.34			0.54	
Control Delay		27.1	7.6	33.5	11.1			15.6			27.4	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		27.1	7.6	33.5	11.1			15.6			27.4	
LOS		C	A	C	B			B			C	
Approach Delay		21.3			17.9			15.6			27.4	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		52	0	24	24			42			55	
Queue Length 95th (ft)		137	48	86	102			124			143	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		817	540	260	777			1151			803	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.41	0.26	0.30	0.23			0.34			0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 63.5
Natural Cycle: 75
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 20.7 Intersection LOS: C
Intersection Capacity Utilization 56.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 7: Prospect Avenue & Park Road

Exhibit 17
Traffic Operations Analysis Worksheets
Existing 2014 PM Peak

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	42	261	377	24	34	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	264	397	25	38	69

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	422	0	-	0	757	409
Stage 1	-	-	-	-	409	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1137	-	-	-	375	642
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1137	-	-	-	359	642
Mov Cap-2 Maneuver	-	-	-	-	359	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1		14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1137	-	-	-	502
HCM Lane V/C Ratio	0.037	-	-	-	0.212
HCM Control Delay (s)	8.3	0	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	286	6	19	399	2	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	289	6	20	420	3	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	295	0	752	292
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	460	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1266	-	378	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1266	-	370	747
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Control Delay, s		0.4	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1266	-
HCM Lane V/C Ratio	0.033	-	-	0.016	-
HCM Control Delay (s)	10.8	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	297	7	10	431	6	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	300	7	10	435	7	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	307	0	759	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	455	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1254	-	374	736
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	639	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1254	-	370	736
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	NB
HCM Control Delay, s		0.2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	462	-	-	1254	-
HCM Lane V/C Ratio	0.024	-	-	0.008	-
HCM Control Delay (s)	13	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	156	85	166	307	80	75	436	92	43	393	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.969			0.977			0.985	
Flt Protected		0.988		0.950				0.994			0.996	
Satd. Flow (prot)	0	3497	1583	1770	1805	0	0	3437	0	0	3472	0
Flt Permitted		0.778		0.950				0.843			0.828	
Satd. Flow (perm)	0	2747	1583	1734	1805	0	0	2912	0	0	2885	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		16			23			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	51	168	91	168	310	81	84	490	103	45	409	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	219	91	168	391	0	0	677	0	0	505	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	21.0	21.0	21.0	13.0	13.0		8.0	8.0		24.0	24.0	
Total Split (%)	23.3%	23.3%	23.3%	14.4%	14.4%		8.9%	8.9%		26.7%	26.7%	
Maximum Green (s)	15.0	15.0	15.0	10.0	10.0		5.0	5.0		18.0	18.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		12.7	12.7	10.2	29.0			26.5			18.4	
Actuated g/C Ratio		0.19	0.19	0.15	0.42			0.39			0.27	
v/c Ratio		0.43	0.23	0.64	0.50			0.57			0.64	
Control Delay		29.2	3.8	42.9	18.3			18.6			28.3	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		29.2	3.8	42.9	18.3			18.6			28.3	
LOS		C	A	D	B			B			C	
Approach Delay		21.8			25.7			18.6			28.3	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		38	0	61	96			83			84	
Queue Length 95th (ft)		96	19	#209	272			218			#231	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		615	457	263	775			1182			783	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.36	0.20	0.64	0.50			0.57			0.64	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 68.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 23.4 — Intersection LOS: C
Intersection Capacity Utilization 78.5% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: Prospect Avenue & Park Road

Exhibit 18
Traffic Operations Analysis Worksheets
Background 2017 AM Peak

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	36	425	156	7	43	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	429	164	7	48	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	172	0	-	0	670	168
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	502	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	422	876
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	608	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1405	-	-	-	408	876
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1405	-	-	-	508
HCM Lane V/C Ratio	0.026	-	-	-	0.149
HCM Control Delay (s)	7.6	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	461	7	13	158	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	466	7	14	166	8	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	473	0	663	469
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	194	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1089	-	426	594
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	839	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1089	-	420	594
Mov Cap-2 Maneuver	-	-	-	-	420	-
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	545	-	-	1089	-
HCM Lane V/C Ratio	0.069	-	-	0.013	-
HCM Control Delay (s)	12.1	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	479	4	1	187	5	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	484	4	1	189	5	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	677	486
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	191	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1075	-	418	581
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	841	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1075	-	418	581
Mov Cap-2 Maneuver	-	-	-	-	418	-
Stage 1	-	-	-	-	618	-
Stage 2	-	-	-	-	840	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	521	-	-	1075	-
HCM Lane V/C Ratio	0.035	-	-	0.001	-
HCM Control Delay (s)	12.2	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	252	138	81	110	73	49	279	39	33	298	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.940			0.984			0.988	
Flt Protected		0.989		0.950				0.993			0.995	
Satd. Flow (prot)	0	3500	1583	1770	1751	0	0	3458	0	0	3479	0
Flt Permitted		0.831		0.950				0.887			0.870	
Satd. Flow (perm)	0	2933	1583	1737	1751	0	0	3084	0	0	3040	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			148		41			14			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	82	271	148	82	111	74	55	313	44	34	310	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	353	148	82	185	0	0	412	0	0	373	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	23.0	23.0	23.0	12.0	12.0		9.0	9.0		22.0	22.0	
Total Split (%)	25.6%	25.6%	25.6%	13.3%	13.3%		10.0%	10.0%		24.4%	24.4%	
Maximum Green (s)	17.0	17.0	17.0	9.0	9.0		6.0	6.0		16.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.1	14.1	8.2	28.5			22.9			13.6	
Actuated g/C Ratio		0.22	0.22	0.13	0.44			0.36			0.21	
v/c Ratio		0.55	0.32	0.36	0.23			0.36			0.57	
Control Delay		27.7	7.5	34.1	11.3			16.0			28.1	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		27.7	7.5	34.1	11.3			16.0			28.1	
LOS		C	A	C	B			B			C	
Approach Delay		21.7			18.3			16.0			28.1	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		57	0	26	27			46			61	
Queue Length 95th (ft)		145	50	90	108			131			152	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		805	542	257	776			1146			791	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.44	0.27	0.32	0.24			0.36			0.47	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 64.1
Natural Cycle: 75
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 21.1
Intersection Capacity Utilization 57.4%
Analysis Period (min) 15

Intersection LOS: C
ICU Level of Service B

Splits and Phases: 7: Prospect Avenue & Park Road

Exhibit 19
Traffic Operations Analysis Worksheets
Background 2017 PM Peak

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	45	273	400	25	36	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	276	421	26	40	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	447	0	-	0	801	434
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1113	-	-	-	354	622
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1113	-	-	-	337	622
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	667	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1113	-	-	-	479
HCM Lane V/C Ratio	0.041	-	-	-	0.237
HCM Control Delay (s)	8.4	0	-	-	14.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	303	6	20	423	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	6	21	445	3	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	312	0	796	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	487	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1248	-	356	731
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	618	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1248	-	348	731
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	632	-	-	1248	-
HCM Lane V/C Ratio	0.036	-	-	0.017	-
HCM Control Delay (s)	10.9	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	315	7	10	457	6	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	318	7	10	462	7	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	325	0	804	322
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	482	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1235	-	352	719
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	348	719
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	439	-	-	1235	-
HCM Lane V/C Ratio	0.025	-	-	0.008	-
HCM Control Delay (s)	13.4	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	165	90	176	325	85	80	462	98	46	417	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.969			0.977			0.985	
Flt Protected		0.988		0.950				0.994			0.996	
Satd. Flow (prot)	0	3497	1583	1770	1805	0	0	3437	0	0	3472	0
Flt Permitted		0.771		0.950				0.828			0.817	
Satd. Flow (perm)	0	2723	1583	1735	1805	0	0	2860	0	0	2847	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		16			23			12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	54	177	97	178	328	86	90	519	110	48	434	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	231	97	178	414	0	0	719	0	0	536	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

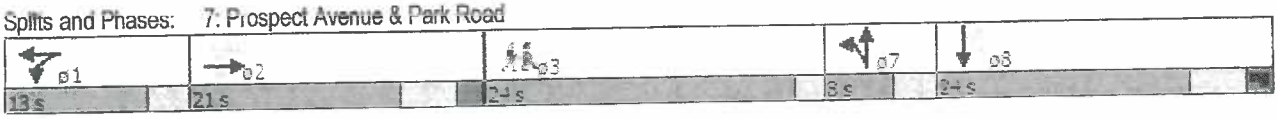
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	21.0	21.0	21.0	13.0	13.0		8.0	8.0		24.0	24.0	
Total Split (%)	23.3%	23.3%	23.3%	14.4%	14.4%		8.9%	8.9%		26.7%	26.7%	
Maximum Green (s)	15.0	15.0	15.0	10.0	10.0		5.0	5.0		18.0	18.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		12.8	12.8	10.2	29.1			26.5			18.4	
Actuated g/C Ratio		0.19	0.19	0.15	0.42			0.39			0.27	
v/c Ratio		0.45	0.24	0.68	0.53			0.62			0.69	
Control Delay		29.6	4.6	45.1	18.9			19.7			30.0	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		29.6	4.6	45.1	18.9			19.7			30.0	
LOS		C	A	D	B			B			C	
Approach Delay		22.2			26.7			19.7			30.0	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		41	0	65	103			89			91	
Queue Length 95th (ft)		101	23	#223	292			#239			#256	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		608	457	263	776			1164			772	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.38	0.21	0.68	0.53			0.62			0.69	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 68.5
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 24.5 Intersection LOS: C
Intersection Capacity Utilization 81.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: Prospect Avenue & Park Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	122	109	57	277	113	201	517	92	95	478	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt			0.850		0.956			0.983			0.956	
Flt Protected	0.950			0.950				0.988			0.994	
Satd. Flow (prot)	1770	1863	1583	1770	1781	0	0	3437	0	0	3363	0
Flt Permitted	0.950			0.679				0.536			0.683	
Satd. Flow (perm)	1770	1863	1583	1265	1781	0	0	1865	0	0	2311	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119		16			16			58	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		580			300			438			1290	
Travel Time (s)		13.2			6.8			10.0			29.3	
Peak Hour Factor	1.00	1.00	1.00	0.73	0.73	0.73	0.84	0.84	0.84	0.99	0.99	0.99
Adj. Flow (vph)	92	122	109	78	379	155	239	615	110	96	483	244
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	122	109	78	534	0	0	964	0	0	823	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Perm	NA		Split	NA		Perm	NA	
Protected Phases	3	3			4		1	1			2	
Permitted Phases		4	3	4	4			2		2		
Detector Phase	3	3	3	4	4		1	1		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0		5.0	5.0		15.0	15.0	
Minimum Split (s)	9.0	9.0	9.0	16.0	16.0		9.0	9.0		22.0	22.0	

Exhibit 20
Traffic Operations Analysis Worksheets
Combined 2017 AM Peak

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	36	431	181	8	43	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	435	191	8	48	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	199	0	-	0	703	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	508	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1373	-	-	-	404	846
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	390	846
Mov Cap-2 Maneuver	-	-	-	-	390	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	583	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1373	-	-	-	486
HCM Lane V/C Ratio	0.026	-	-	-	0.155
HCM Control Delay (s)	7.7	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	467	7	13	181	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	472	7	14	191	8	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	479	0	693	475
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	218	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1083	-	409	590
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	818	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1083	-	403	590
Mov Cap-2 Maneuver	-	-	-	-	403	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	807	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	536	-	-	1083	-
HCM Lane V/C Ratio	0.07	-	-	0.013	-
HCM Control Delay (s)	12.2	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	479	10	9	187	30	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	484	10	9	189	33	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	494	0	696	489
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	207	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1070	-	408	579
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	828	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1070	-	404	579
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	507	-	-	1070	-
HCM Lane V/C Ratio	0.197	-	-	0.008	-
HCM Control Delay (s)	13.8	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	261	157	83	112	73	49	301	48	33	304	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.941			0.982			0.986	
Flt Protected		0.987		0.950				0.994			0.996	
Satd. Flow (prot)	0	3493	1583	1770	1753	0	0	3455	0	0	3476	0
Flt Permitted		0.814		0.950				0.889			0.867	
Satd. Flow (perm)	0	2871	1583	1739	1753	0	0	3086	0	0	3023	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164		41			17			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	105	281	169	84	113	74	55	338	54	34	317	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	386	169	84	187	0	0	447	0	0	386	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	23.0	23.0	23.0	12.0	12.0		9.0	9.0		22.0	22.0	
Total Split (%)	25.6%	25.6%	25.6%	13.3%	13.3%		10.0%	10.0%		24.4%	24.4%	
Maximum Green (s)	17.0	17.0	17.0	9.0	9.0		6.0	6.0		16.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.7	14.7	8.2	29.0			23.0			13.7	
Actuated g/C Ratio		0.23	0.23	0.13	0.45			0.35			0.21	
v/c Ratio		0.59	0.35	0.38	0.23			0.39			0.60	
Control Delay		28.6	7.7	35.0	11.3			16.5			28.8	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		28.6	7.7	35.0	11.3			16.5			28.8	
LOS		C	A	D	B			B			C	
Approach Delay		22.2			18.6			16.5			28.8	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		64	1	28	28			52			64	
Queue Length 95th (ft)		159	55	92	109			142			156	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		778	548	254	783			1141			779	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.50	0.31	0.33	0.24			0.39			0.50	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 64.8
Natural Cycle: 75
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 21.6 — Intersection LOS: C
Intersection Capacity Utilization 58.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 7: Prospect Avenue & Park Road

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	31	18	9	365	516	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	100	89	96	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	20	9	410	538	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	765	273	546	0	-	0
Stage 1	542	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	340	725	1019	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	336	725	1019	-	-	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	784	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1019	-	418	-	-
HCM Lane V/C Ratio	0.009	-	0.127	-	-
HCM Control Delay (s)	8.6	0	14.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Exhibit 21
Traffic Operations Analysis Worksheets
Combined 2017 PM Peak

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	45	298	414	25	36	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	99	99	95	95	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	301	436	26	40	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	462	0	-	0	841	449
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	392	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1099	-	-	-	335	610
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	683	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1099	-	-	-	319	610
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1099	-	-	-	461
HCM Lane V/C Ratio	0.041	-	-	-	0.246
HCM Control Delay (s)	8.4	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	334	6	20	437	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	95	95	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	337	6	21	460	3	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	343	0	842	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	502	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1216	-	334	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	608	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1216	-	326	702
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	594	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	603	-	-	1216	-
HCM Lane V/C Ratio	0.038	-	-	0.017	-
HCM Control Delay (s)	11.2	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	315	32	41	457	20	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	100	100	99	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	318	32	41	462	22	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	350	0	878	334
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	544	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1209	-	318	708
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1209	-	303	708
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	555	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	468	-	-	1209	-
HCM Lane V/C Ratio	0.121	-	-	0.034	-
HCM Control Delay (s)	13.7	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	170	101	185	334	85	80	474	103	46	439	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		75	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00		0.98				1.00			1.00	
Frt			0.850		0.970			0.976			0.980	
Flt Protected		0.987		0.950				0.994			0.996	
Satd. Flow (prot)	0	3493	1583	1770	1807	0	0	3434	0	0	3455	0
Flt Permitted		0.752		0.950				0.800			0.821	
Satd. Flow (perm)	0	2655	1583	1736	1807	0	0	2761	0	0	2847	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		16			24			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		615			300			400			300	
Travel Time (s)		14.0			6.8			9.1			6.8	
Confl. Peds. (#/hr)	10			10			10			10		
Peak Hour Factor	0.93	0.93	0.93	0.99	0.99	0.99	0.89	0.89	0.89	0.96	0.96	0.96
Adj. Flow (vph)	67	183	109	187	337	86	90	533	116	48	457	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	250	109	187	423	0	0	739	0	0	582	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Split	NA		Split	NA		Perm	NA	
Protected Phases		2		1	1		7	7			8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		2		2			8		8	8	
Detector Phase	2	2	2	1	1		7	7		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0	12.0	6.0	6.0		3.0	3.0		12.0	12.0	
Minimum Split (s)	18.0	18.0	18.0	9.0	9.0		6.0	6.0		18.0	18.0	
Total Split (s)	21.0	21.0	21.0	13.0	13.0		8.0	8.0		24.0	24.0	
Total Split (%)	23.3%	23.3%	23.3%	14.4%	14.4%		8.9%	8.9%		26.7%	26.7%	
Maximum Green (s)	15.0	15.0	15.0	10.0	10.0		5.0	5.0		18.0	18.0	
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0		3.0	3.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0		0.0	0.0		2.0	2.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)		6.0	6.0	3.0	3.0			3.0			6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	None	None		None	None		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		13.0	13.0	10.2	29.3			26.5			18.4	
Actuated g/C Ratio		0.19	0.19	0.15	0.43			0.39			0.27	
v/c Ratio		0.50	0.27	0.71	0.54			0.65			0.75	
Control Delay		30.3	6.0	47.6	19.0			20.8			32.1	
Queue Delay		0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay		30.3	6.0	47.6	19.0			20.8			32.1	
LOS		C	A	D	B			C			C	
Approach Delay		22.9			27.8			20.8			32.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)		45	0	68	106			92			101	
Queue Length 95th (ft)		109	32	#236	299			#267			#286	
Internal Link Dist (ft)		535			220			320			220	
Turn Bay Length (ft)			75									
Base Capacity (vph)		591	456	262	780			1130			773	
Starvation Cap Reductn		0	0	0	0			0			0	
Spillback Cap Reductn		0	0	0	0			0			0	
Storage Cap Reductn		0	0	0	0			0			0	
Reduced v/c Ratio		0.42	0.24	0.71	0.54			0.65			0.75	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 68.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 7: Prospect Avenue & Park Road

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	18	10	37	639	682	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	100	89	96	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	11	37	718	710	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1159	371	741	0	-	0
Stage 1	726	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	189	626	862	-	-	-
Stage 1	440	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	626	862	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	440	-	-	-	-	-
Stage 2	577	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.4	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	862	-	237	-	-
HCM Lane V/C Ratio	0.043	-	0.128	-	-
HCM Control Delay (s)	9.4	0.3	22.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	122	109	57	277	113	201	537	92	95	493	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Frt			0.850		0.956			0.983			0.955	
Flt Protected	0.950			0.950				0.988			0.994	
Satd. Flow (prot)	1770	1863	1583	1770	1781	0	0	3437	0	0	3360	0
Flt Permitted	0.950			0.679				0.529			0.678	
Satd. Flow (perm)	1770	1863	1583	1265	1781	0	0	1840	0	0	2292	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119		16			15			58	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		580			300			438			1290	
Travel Time (s)		13.2			6.8			10.0			29.3	
Peak Hour Factor	1.00	1.00	1.00	0.73	0.73	0.73	0.84	0.84	0.84	0.99	0.99	0.99
Adj. Flow (vph)	109	122	109	78	379	155	239	639	110	96	498	251
Shared Lane Traffic (%)												
Lane Group Flow (vph)	109	122	109	78	534	0	0	988	0	0	845	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Perm	NA		Split	NA		Perm	NA	
Protected Phases	3	3			4		1	1			2	
Permitted Phases		4	3	4	4			2		2		
Detector Phase	3	3	3	4	4		1	1		2	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	10.0	10.0		5.0	5.0		15.0	15.0	
Minimum Split (s)	9.0	9.0	9.0	16.0	16.0		9.0	9.0		22.0	22.0	

ENCLOSURE H
Storm Drainage Report

Storm Drainage Report
Center Development Corporation &
Sisters of St. Joseph Corporation
Arcadia Crossing
One Park Road
West Hartford, Connecticut

Prepared by:

Design Professionals, Inc.
21 Jeffrey Drive, PO Box 1167
South Windsor, CT 06074

October 14, 2015

Table of Contents

1. Introduction

The Center Development Corporation (CDC) and the Sisters of St. Joseph Corporation (SSJC) are planning to develop a 19.52 acre parcel of land located at the southwest corner of Park Road and Prospect Avenue in West Hartford, Connecticut. The proposed scope of work will include the redevelopment of the existing buildings on the property and construction of a new building to house 346 apartment units, together with all attendant parking, utilities, landscaping, lighting, and signage. Refer to the site plan drawings, entitled – "Arcadia Crossing, One Park Road, West Hartford, Connecticut, prepared by Design Professionals, Inc, et. al. dated October 14, 2015", as amended, for information regarding the proposed property development.

2. Pre-Development Site Conditions

The surficial characteristics of the site can primarily be classified as developed lands with a combination of grass, roof, and paved areas. A vast majority of the site drains southwest across the parcel to an existing brook. All stormwater captured by the brook is conveyed to the municipal drainage system in Prospect Avenue. Areas to the north of the existing building currently drain to the stormwater drainage system in Park Road. This system conveys all captured stormwater to the afore-mentioned brook running through the parcel. The remaining east side of the parcel sheet flows directly to the municipal storm drainage system in Prospect Avenue. Refer to the Existing Conditions Drainage Area Map included in Appendix F for watershed delineations.

In order to establish a hydrologic comparison between pre- and post-development conditions, an evaluation was performed to quantify the peak rate of stormwater discharge to each of the designated areas within and off the site. The NRCS as outlined in the USDA TR-55 Manual, was followed in predicting the peak rates of runoff and volumes. Hydraflow Hydrographs (version 2013) computer modeling software was used as application. Refer to Appendix C for design criteria implemented.

The peak rates of stormwater runoff discharging to neighboring properties were determined for the 5-, 10-, 25-, and 100-year storm events. Refer to Appendix A for the pre-developed conditions watershed computations.

3. Post-Development Site Conditions

To capture runoff from the new/renovated buildings and parking areas, multiple networks of catchbasins and storm drainage pipes have been designed to convey most of the site's generated runoff to a proposed detention basin. The detention basin was designed to be 4 feet deep and provide an available storage of 103,000± cubic feet. The detention basin will be fitted with an outlet structure sized with a 17 inch orifice positioned at the bottom of the basin at elevation 43.5 and a grate installed 1 foot below the top of the basin at elevation 46.5. This grate will serve as an emergency outlet along with a spillway set at elevation 47 should the outlet structure fail. All runoff collected from the northerly and westerly parking areas (outside of parking garage) will be treated by a Stormceptor STC-

2400 hydrodynamic separator before being discharged to the basin. Runoff leaving the roof and eastern grass areas will be conveyed directly to the detention basin though separate drainage networks. The southerly parking area will sheet flow directly to the basin. Proposed grading for outside the parking areas was done to limit the areas draining to Park Road and Prospect Avenue directly. Refer to the Proposed Drainage Area Map located in Appendix F for proposed watershed delineations. All proposed drainage watershed analysis computations can be found in Appendix B.

4. Storm Sewer Collection System

The proposed subsurface stormwater collection and conveyance system was designed to adequately convey proposed runoff under 10- year storm event conditions. The design of the storm sewers followed the guidelines set forth in the Connecticut Department of Transportation's Drainage Manual. It is estimated that during a 10-year storm event, all proposed subsurface culverts will convey storm runoff without resulting in any unacceptable flooding conditions. Hydraflow Storm Sewers computer software was used for analysis. The computations are included as Appendix D.

5. Analysis of Results

Hydraulic conditions related to storm drainage were evaluated for both proposed and existing conditions using Hydraflow Hydrographs (version 2013) computer modeling software to determine peak discharge rates of runoff leaving the site. Based on modeling from existing conditions, three discharge locations were identified as points of interest for assessing downstream effects. The following table contains the data generated from the Hydraflow software:

TABLE 1

Peak Rate of Stormwater Discharge

		Runoff Rate		
Watershed Area	**Storm Event (Year)**	**Pre-developed Condition (ft^3/second)**	**Post-developed Condition (ft^3/second)**	**Net Change Rate of Runoff (ft^3/second)**
DP#1 – To Park Road	5	2.83	0.69	-2.14
	10	3.56	0.86	-2.69
	25	4.55	1.10	-3.45
	100	6.33	1.52	-4.81
DP#2 - To Culvert	5	12.88	10.46	-2.42
	10	16.49	12.74	-3.75
	25	21.51	15.83	-5.68
	100	30.66	21.23	-9.43
DP#3 – To Prospect Ave	5	0.14	0.14	0.00
	10	0.18	0.17	-0.01
	25	0.23	0.21	-0.03
	100	0.34	0.28	-0.06

The above results demonstrate a net-reduction in peak flows leaving the site as compared to existing conditions.

6. Water Quality

The proposed stormceptor unit will serve to remove suspended solids of runoff collected from the northerly and westerly parking areas before discharging to the proposed detention basin for the site. Per manufacturer's specifications, the units are designed to achieve an 80% total suspended solid removal rating as recommended by The Connecticut Department of Energy and Environmental Protection. See Appendix E for our sizing and analysis report for the Stormceptor unit. This report was generated using design software from Imbrium Systems Inc.

7. Flood Plain Management

The site plan depicts an increase in the flood storage volume by means of an excavation adjacent to the detention basin.

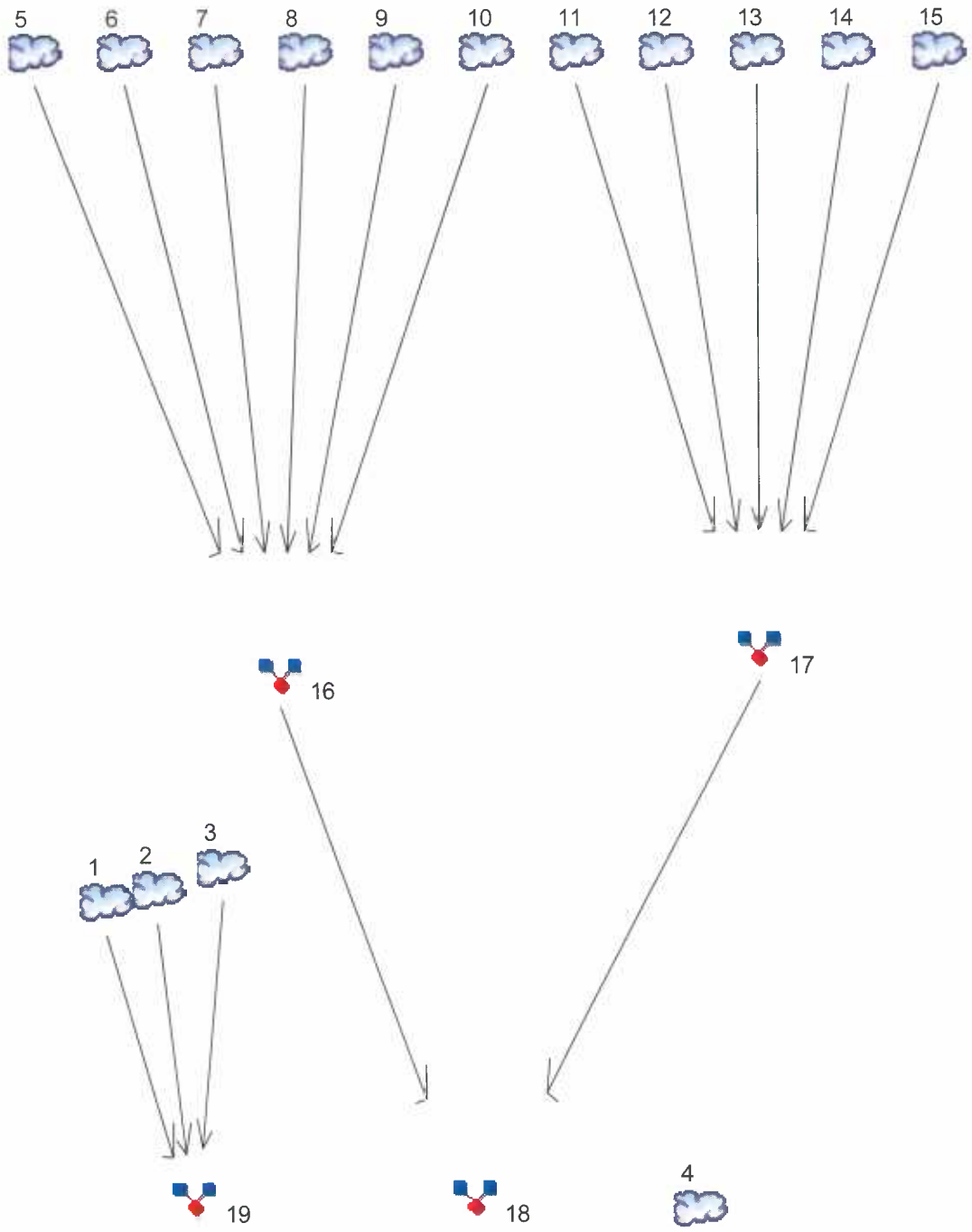
8. Conclusion

It is our opinion that the proposed stormwater management design as presented herein and on the accompanying site plans, will not pose any significant detrimental impacts to the environment surrounding the site.

APPENDIX A
Watershed Computations
(Pre-Development Conditions)

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10



Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.328	-------	0.515	0.647	0.828	0.990	1.153	TO EX. CATCHBASIN3
2	SCS Runoff	------	-------	0.593	-------	0.911	1.131	1.432	1.698	1.966	TO EX. CATHBASIN2
3	SCS Runoff	------	-------	0.885	-------	1.406	1.779	2.291	2.748	3.212	TO EX. CATCHBASIN1
4	SCS Runoff	------	-------	0.081	-------	0.137	0.177	0.234	0.286	0.338	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	------	-------	1.574	-------	2.502	3.164	4.076	4.890	5.714	WATERSHED#1
6	SCS Runoff	------	-------	0.833	-------	1.388	1.789	2.346	2.848	3.359	WATERSHED#2
7	SCS Runoff	------	-------	1.422	-------	2.498	3.294	4.413	5.432	6.477	WATERSHED#3
8	SCS Runoff	------	-------	1.860	-------	2.964	3.740	4.807	5.759	6.729	WATERSHED#4
9	SCS Runoff	------	-------	0.864	-------	1.519	2.000	2.679	3.298	3.933	WATERSHED#5
10	SCS Runoff	------	-------	0.468	-------	0.879	1.186	1.625	2.032	2.453	WATERSHED#6
11	SCS Runoff	------	-------	0.329	-------	0.424	0.487	0.571	0.644	0.718	WATERSHED#7
12	SCS Runoff	------	-------	0.411	-------	0.594	0.718	0.884	1.030	1.175	WATERSHED#8
13	SCS Runoff	------	-------	1.677	-------	2.159	2.480	2.907	3.280	3.653	WATERSHED#9
14	SCS Runoff	------	-------	0.115	-------	0.239	0.334	0.470	0.596	0.728	WATERSHED#10
15	SCS Runoff	------	-------	0.210	-------	0.270	0.310	0.363	0.410	0.457	WATERSHED#11
16	Combine	5, 6, 7,	-------	6.603	-------	11.12	14.40	18.98	23.11	27.34	WATER TO BROOK 1
17	Combine	8, 9, 10, 11, 12, 13,	-------	2.671	-------	3.585	4.206	5.043	5.783	6.528	WATER TO BROOK 2
18	Combine	14, 15, 16, 17	-------	7.841	-------	12.88	16.49	21.51	26.04	30.66	DP#2 - TOTAL WATER TO CULVER
19	Combine	1, 2, 3,	-------	1.806	-------	2.832	3.557	4.551	5.436	6.330	DP#1 - TO PARK ROAD

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.515	2	728	1,988	------	------	------	TO EX. CATCHBASIN3
2	SCS Runoff	0.911	2	728	3,499	------	------	------	TO EX. CATHBASIN2
3	SCS Runoff	1.406	2	728	5,449	------	------	------	TO EX. CATCHBASIN1
4	SCS Runoff	0.137	2	730	539	------	------	------	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	2.502	2	728	9,695	------	------	------	WATERSHED#1
6	SCS Runoff	1.388	2	738	6,982	------	------	------	WATERSHED#2
7	SCS Runoff	2.498	2	736	12,325	------	------	------	WATERSHED#3
8	SCS Runoff	2.964	2	734	13,176	------	------	------	WATERSHED#4
9	SCS Runoff	1.519	2	740	7,789	------	------	------	WATERSHED#5
10	SCS Runoff	0.879	2	740	4,624	------	------	------	WATERSHED#6
11	SCS Runoff	0.424	2	724	1,447	------	------	------	WATERSHED#7
12	SCS Runoff	0.594	2	726	2,034	------	------	------	WATERSHED#8
13	SCS Runoff	2.159	2	724	7,365	------	------	------	WATERSHED#9
14	SCS Runoff	0.239	2	730	1,017	------	------	------	WATERSHED#10
15	SCS Runoff	0.270	2	724	921	------	------	------	WATERSHED#11
16	Combine	11.12	2	734	54,591	5, 6, 7,	------	------	WATER TO BROOK 1
17	Combine	3.585	2	724	12,785	8, 9, 10, 11, 12, 13,	------	------	WATER TO BROOK 2
18	Combine	12.88	2	734	67,375	14, 15, 16, 17	------	------	DP#2 - TOTAL WATER TO CULVER
19	Combine	2.832	2	728	10,937	1, 2, 3,	------	------	DP#1 - TO PARK ROAD

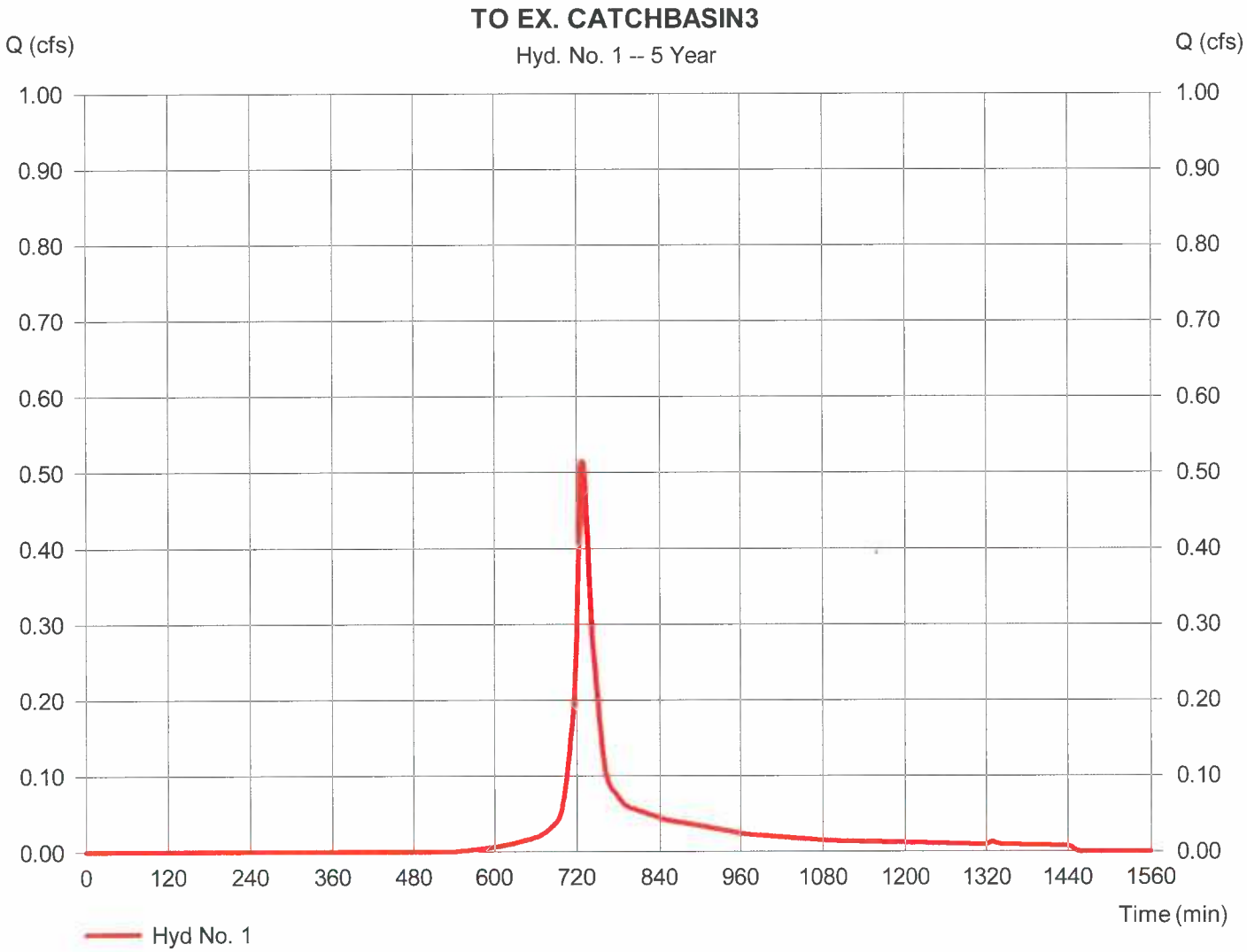
Hydrograph Report

Hyd. No. 1

TO EX. CATCHBASIN3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.515 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,988 cuft
Drainage area	= 0.270 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.090 x 61) + (0.030 x 74) + (0.070 x 80) + (0.080 x 98)] / 0.270



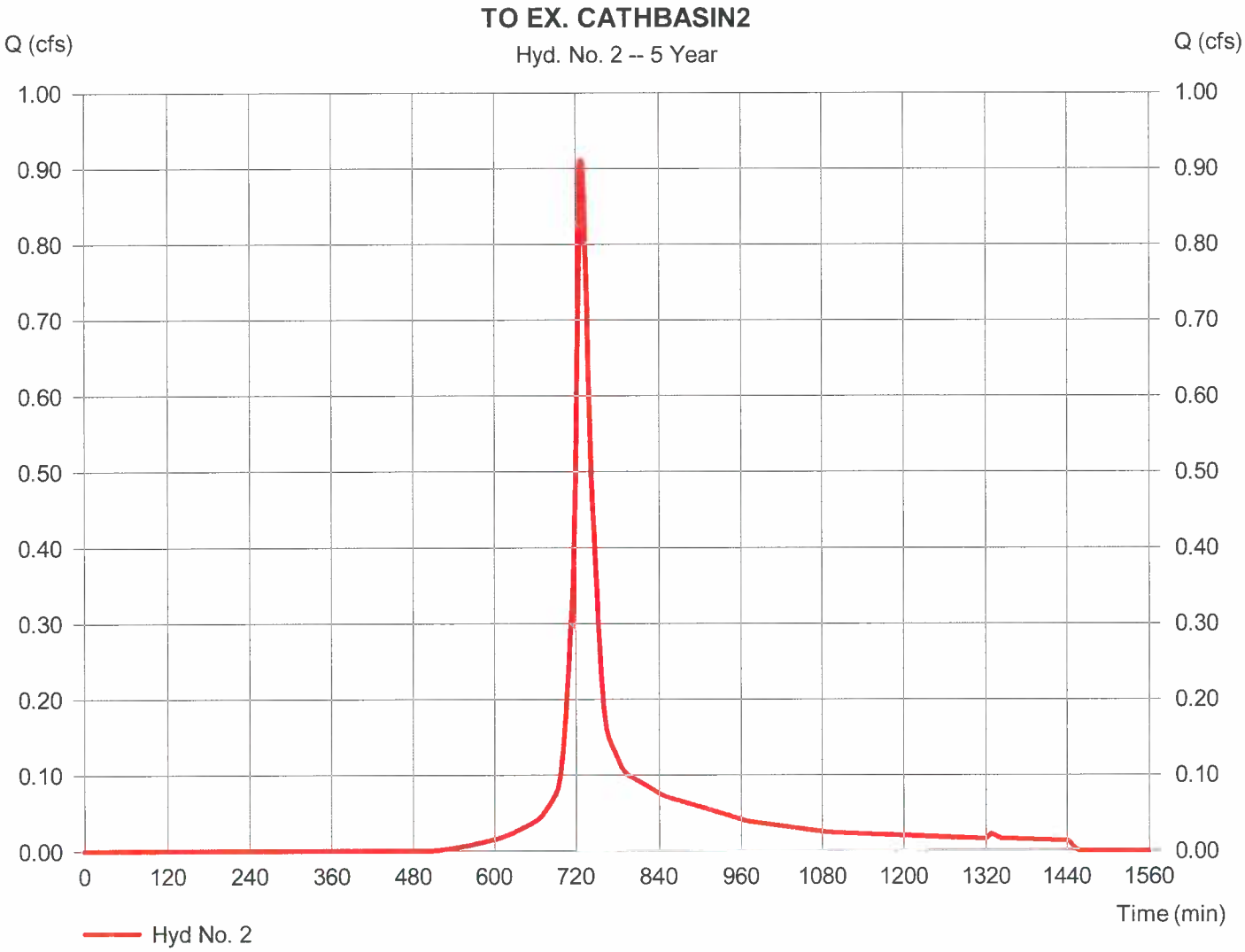
Hydrograph Report

Hyd. No. 2

TO EX. CATHBASIN2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.911 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,499 cuft
Drainage area	= 0.440 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.130 x 98) + (0.070 x 98) + (0.200 x 61) + (0.040 x 80)] / 0.440



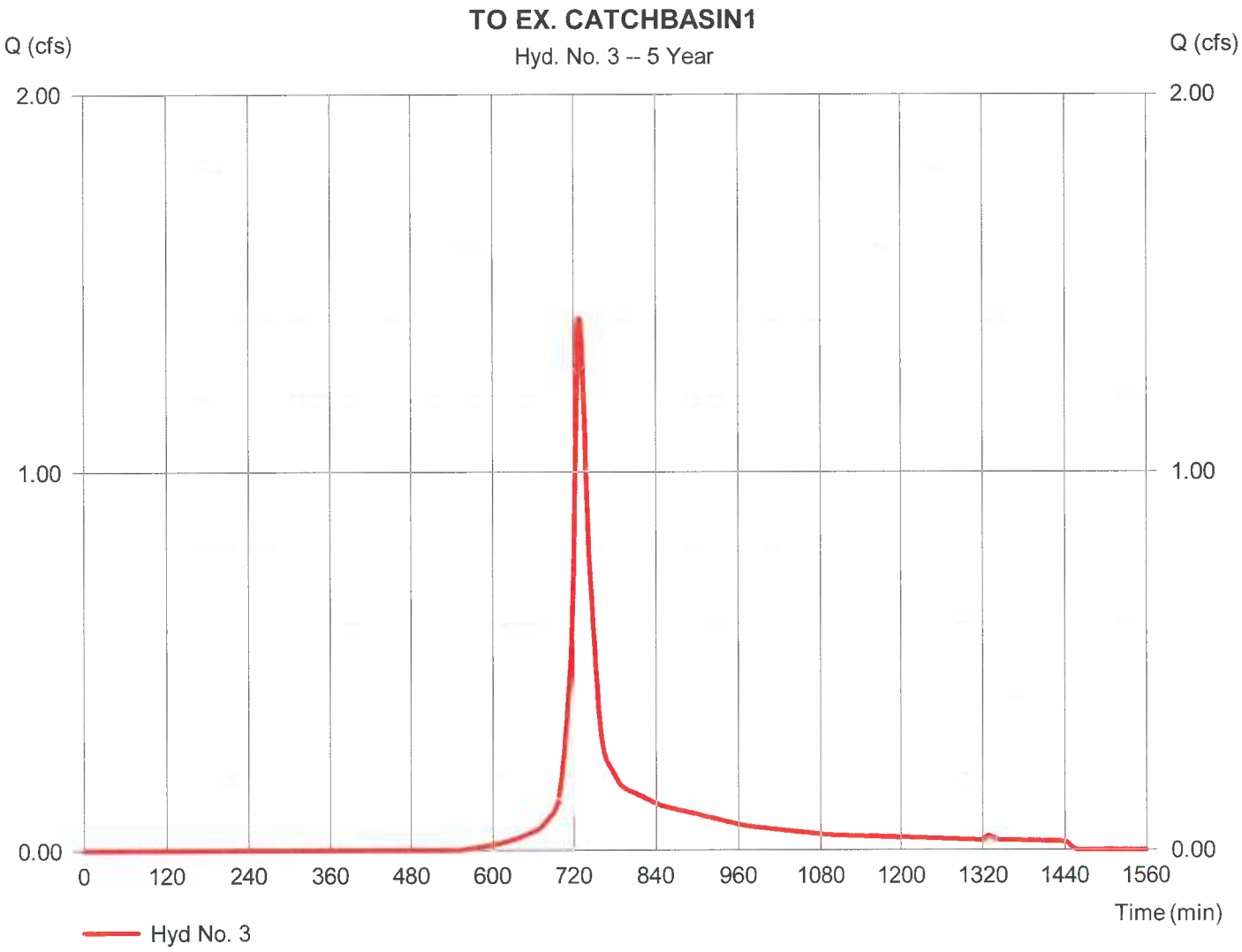
Hydrograph Report

Hyd. No. 3

TO EX. CATCHBASIN1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.406 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 5,449 cuft
Drainage area	= 0.770 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 98) + (0.110 x 98) + (0.380 x 61) + (0.130 x 80)] / 0.770



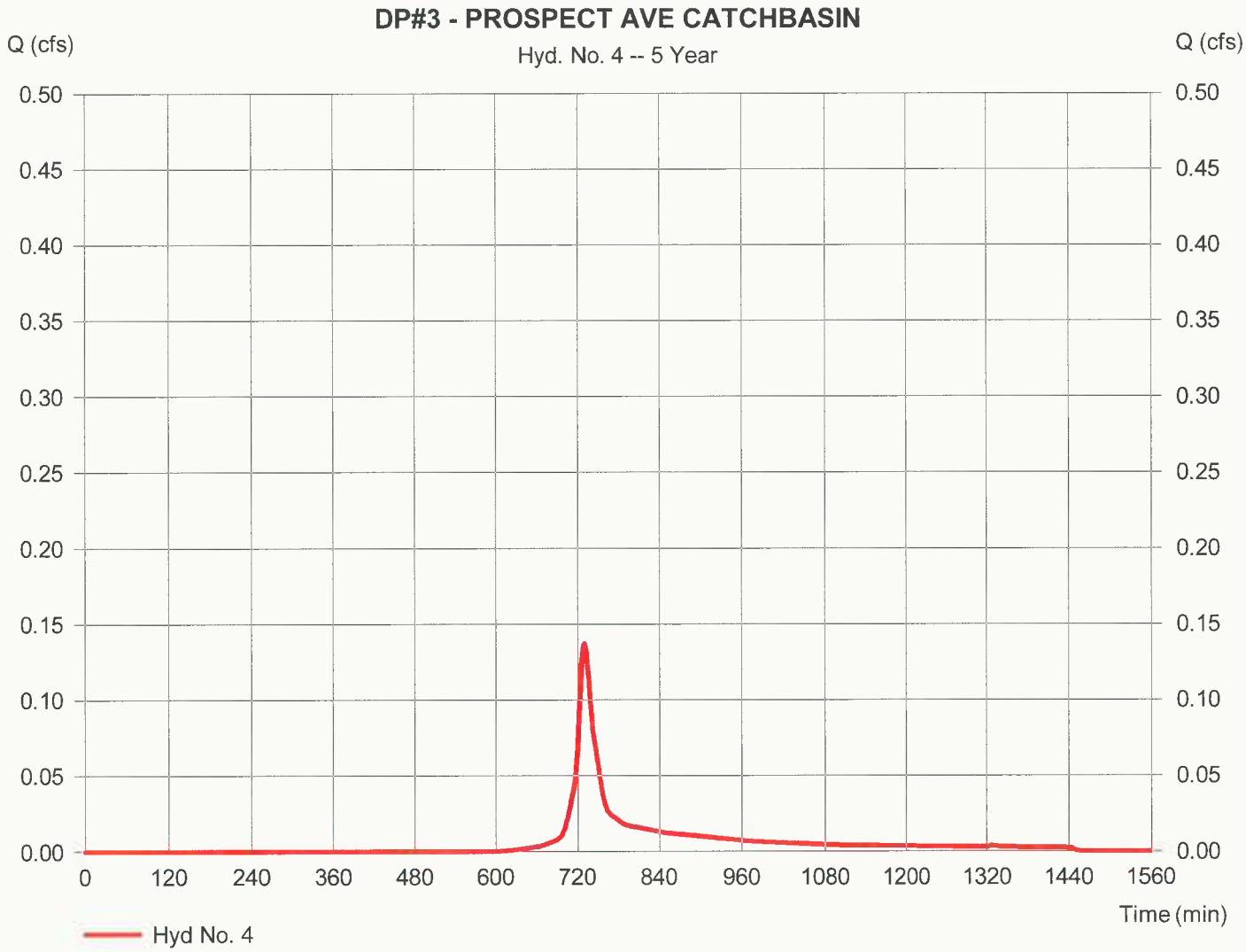
Hydrograph Report

Hyd. No. 4

DP#3 - PROSPECT AVE CATCHBASIN

Hydrograph type	= SCS Runoff	Peak discharge	= 0.137 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 539 cuft
Drainage area	= 0.090 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.004 x 98) + (0.017 x 61) + (0.067 x 74)] / 0.090



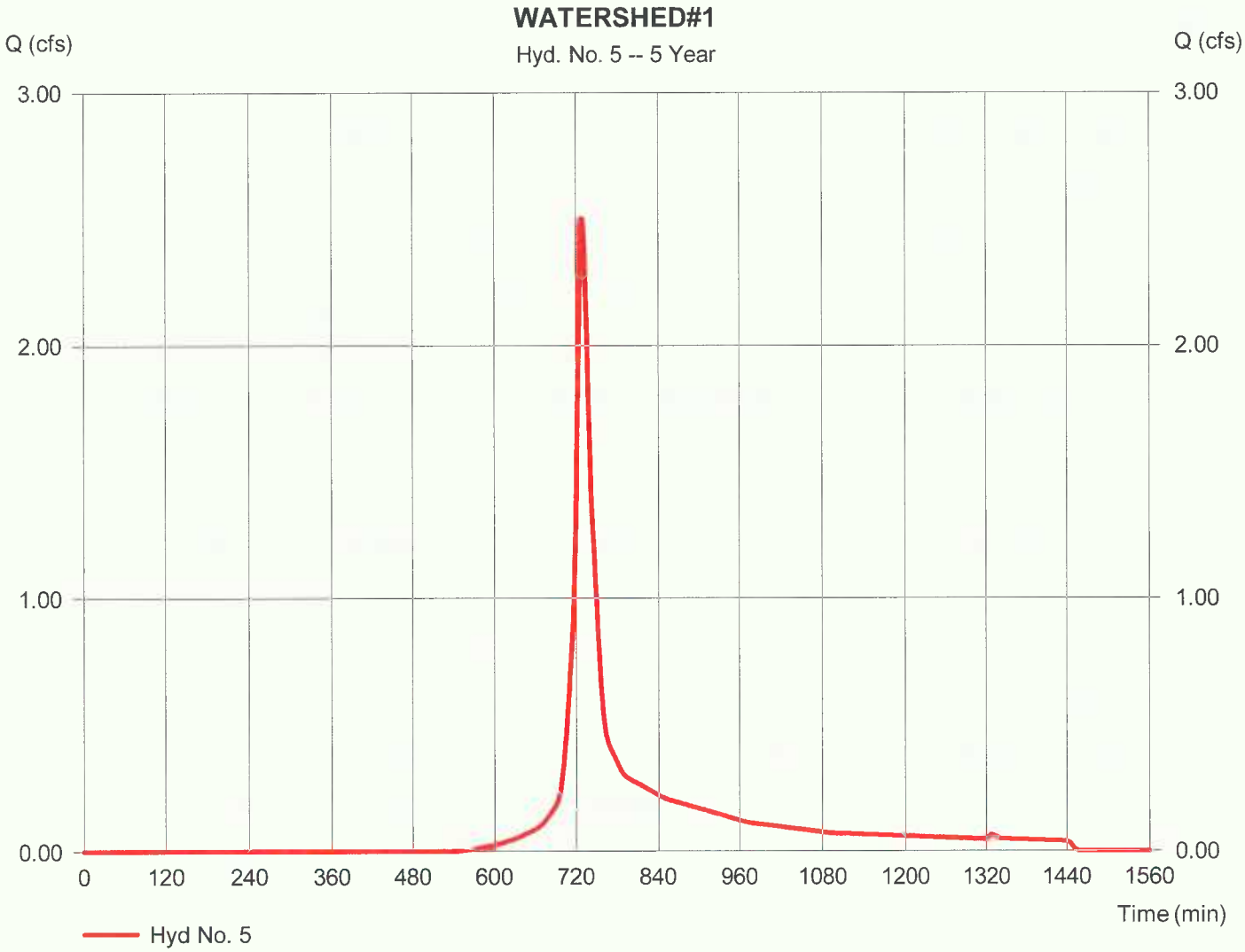
Hydrograph Report

Hyd. No. 5

WATERSHED#1

Hydrograph type	= SCS Runoff	Peak discharge	= 2.502 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 9,695 cuft
Drainage area	= 1.370 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 11.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.160 x 98) + (0.090 x 98) + (0.190 x 61) + (0.910 x 74) + (0.020 x 80)] / 1.370



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 5

WATERSHED#1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.120		0.011		0.011		
Flow length (ft)	= 260.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 6.50		0.00		0.00		
Travel Time (min)	**= 10.99**	**+**	**0.00**	**+**	**0.00**	**=**	**10.99**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.050		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **11.00 min**

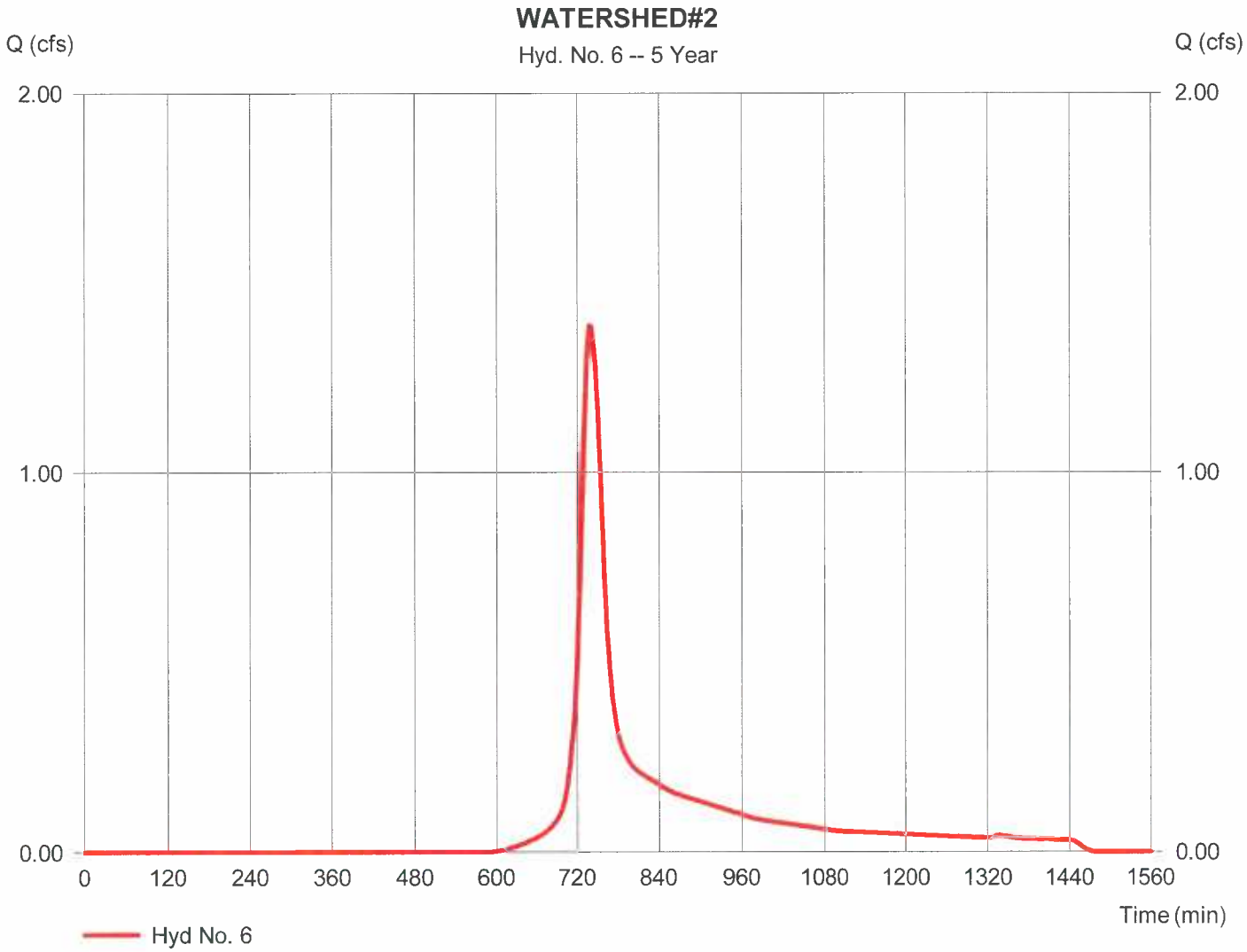
Hydrograph Report

Hyd. No. 6

WATERSHED#2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.388 cfs
Storm frequency	= 5 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 6,982 cuft
Drainage area	= 1.170 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.30 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.110 x 98) + (0.220 x 61) + (0.840 x 74)] / 1.170



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 6

WATERSHED#2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 5.50		0.00		0.00		
Travel Time (min)	**= 22.93**	**+**	**0.00**	**+**	**0.00**	**=**	**22.93**
Shallow Concentrated Flow							
Flow length (ft)	= 159.58		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.98		0.00		0.00		
Travel Time (min)	**= 1.35**	**+**	**0.00**	**+**	**0.00**	**=**	**1.35**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.050		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **24.30 min**

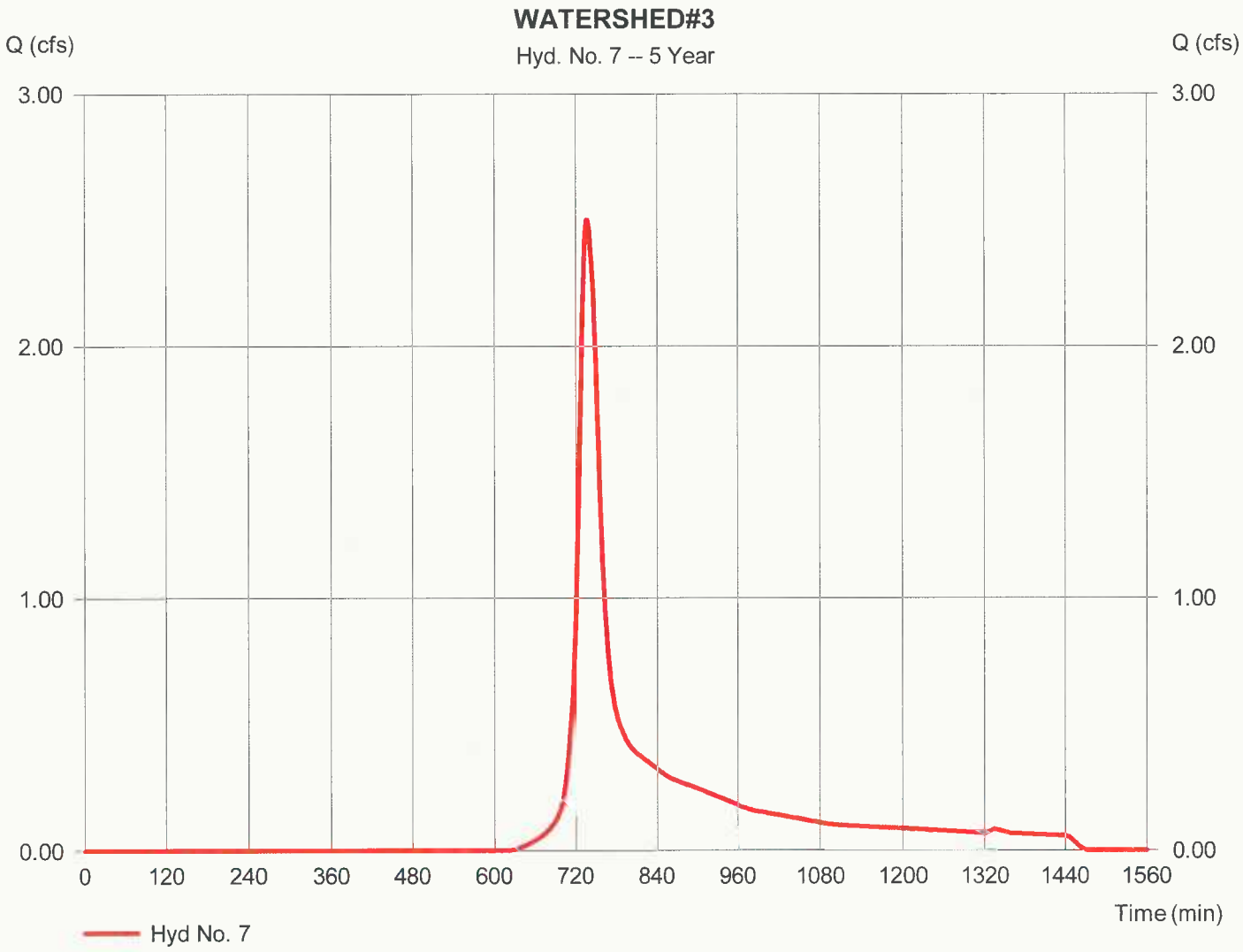
Hydrograph Report

Hyd. No. 7

WATERSHED#3

Hydrograph type	= SCS Runoff	Peak discharge	= 2.498 cfs
Storm frequency	= 5 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 12,325 cuft
Drainage area	= 2.280 ac	Curve number	= 71*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 20.80 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.300 x 98) + (0.050 x 98) + (1.240 x 61) + (0.690 x 74)] / 2.280



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 7

WATERSHED#3

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.200		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 5.50		0.00		0.00		
Travel Time (min)	**= 19.82**	**+**	**0.00**	**+**	**0.00**	**=**	**19.82**
Shallow Concentrated Flow							
Flow length (ft)	= 160.07		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 0.99**	**+**	**0.00**	**+**	**0.00**	**=**	**0.99**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.050		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **20.80 min**

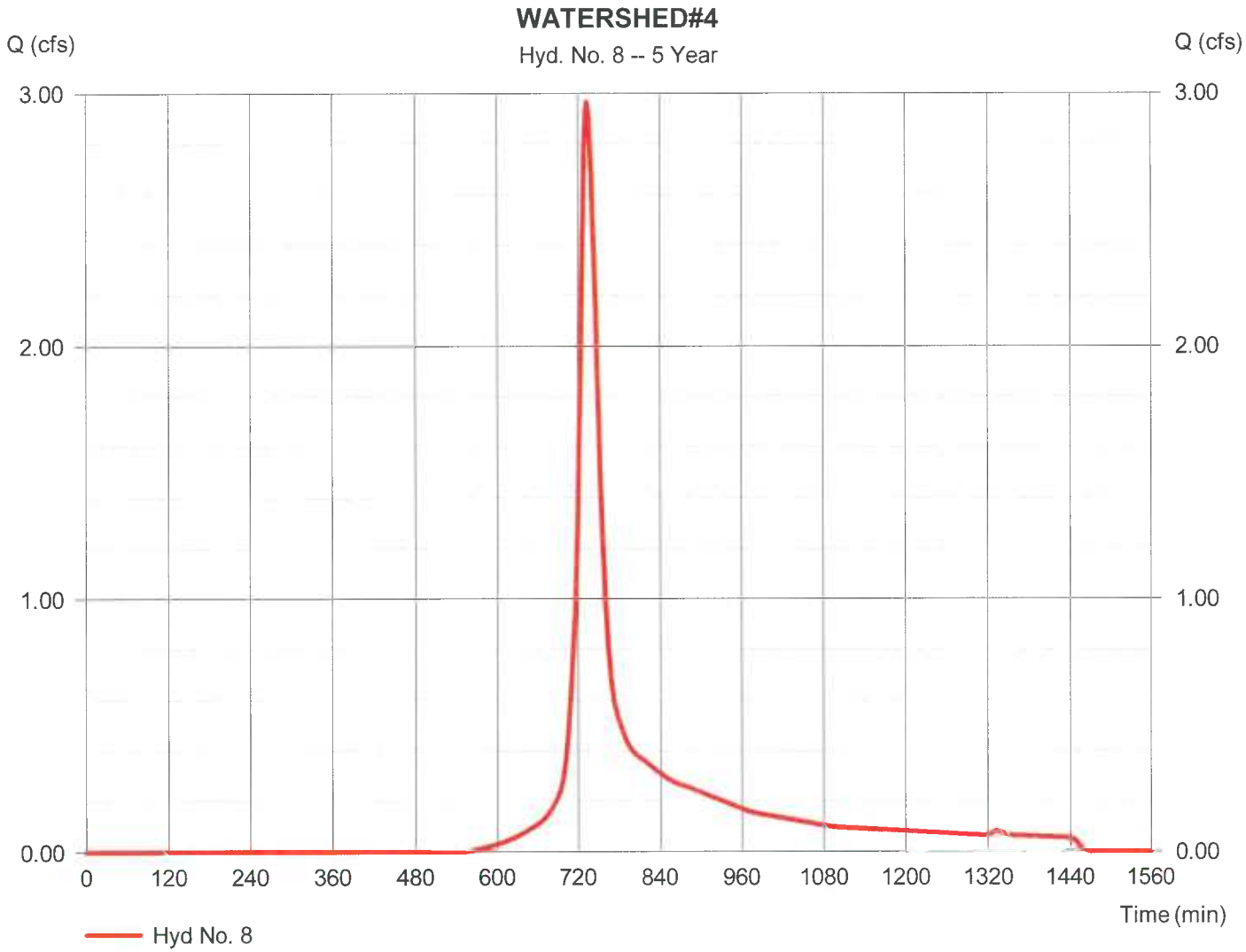
Hydrograph Report

Hyd. No. 8

WATERSHED#4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.964 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 13,176 cuft
Drainage area	= 1.920 ac	Curve number	= 77*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 18.80 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.500 x 98) + (0.050 x 98) + (0.510 x 61) + (0.860 x 74)] / 1.920



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 8

WATERSHED#4

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.200		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 7.00		0.00		0.00		
Travel Time (min)	**= 18.00**	**+**	**0.00**	**+**	**0.00**	**=**	**18.00**
Shallow Concentrated Flow							
Flow length (ft)	= 113.66		0.00		0.00		
Watercourse slope (%)	= 2.11		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.34		0.00		0.00		
Travel Time (min)	**= 0.81**	**+**	**0.00**	**+**	**0.00**	**=**	**0.81**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.050		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **18.80 min**

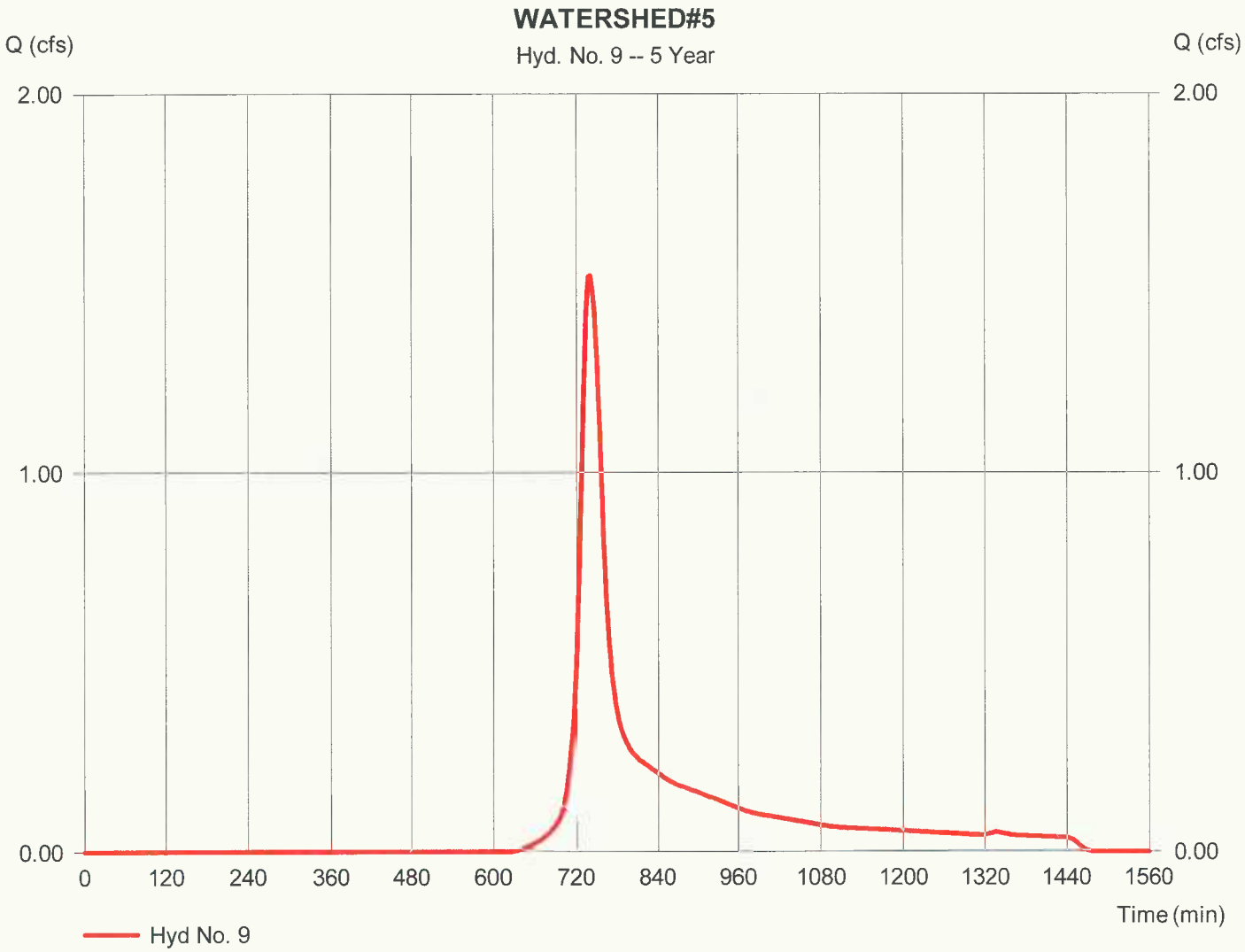
Hydrograph Report

Hyd. No. 9

WATERSHED#5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.519 cfs
Storm frequency	= 5 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 7,789 cuft
Drainage area	= 1.490 ac	Curve number	= 71*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.340 x 61) + (1.150 x 74)] / 1.490



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 9

WATERSHED#5

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 4.20		0.00		0.00		
Travel Time (min)	**= 25.54**	**+**	**0.00**	**+**	**0.00**	**=**	**25.54**
Shallow Concentrated Flow							
Flow length (ft)	= 31.58		0.00		0.00		
Watercourse slope (%)	= 7.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.45		0.00		0.00		
Travel Time (min)	**= 0.12**	**+**	**0.00**	**+**	**0.00**	**=**	**0.12**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.050		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... **25.70 min**

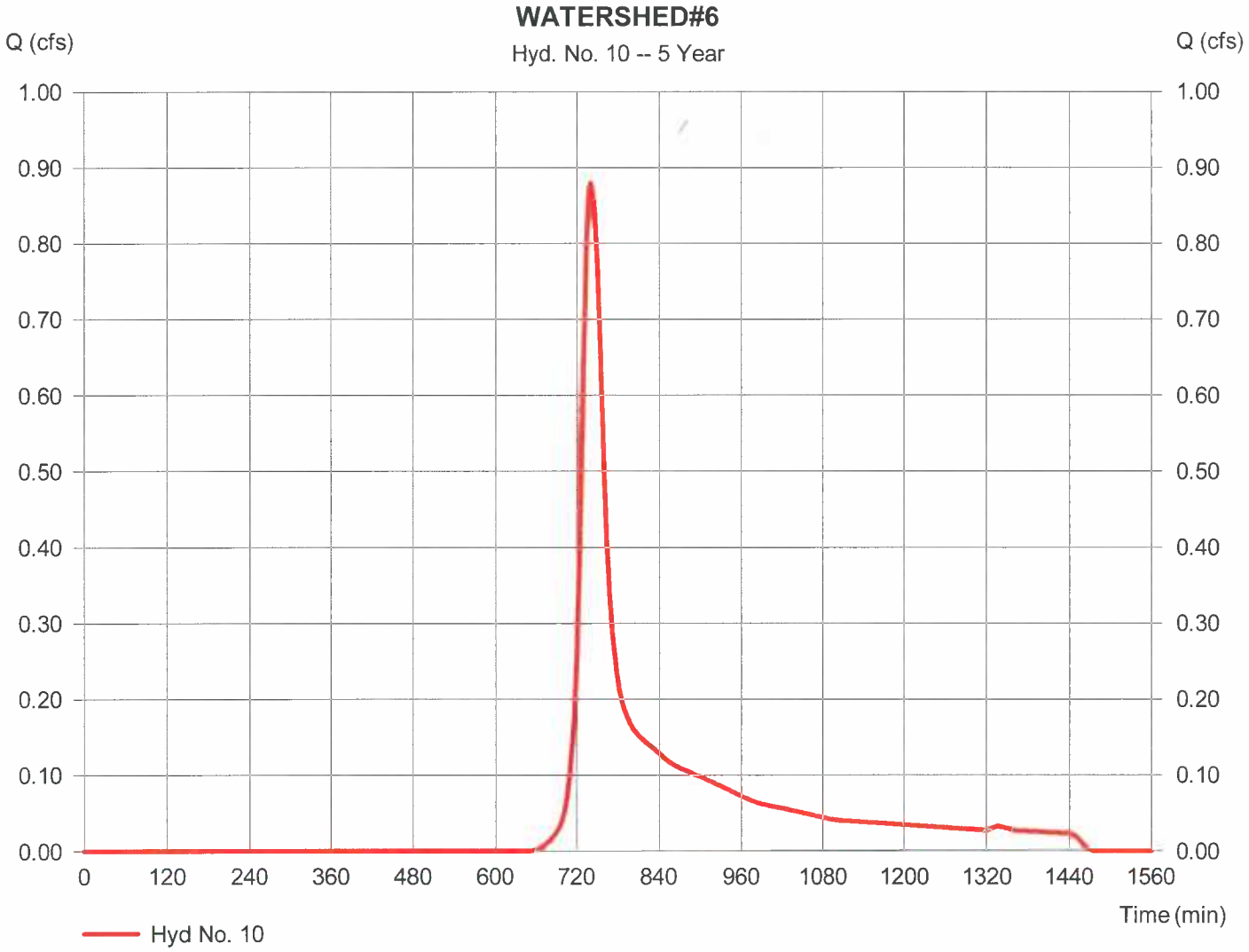
Hydrograph Report

Hyd. No. 10

WATERSHED#6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.879 cfs
Storm frequency	= 5 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 4,624 cuft
Drainage area	= 1.020 ac	Curve number	= 68*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 25.70 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.180 x 98) + (0.810 x 61) + (0.030 x 74)] / 1.020



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 10

WATERSHED#6

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.20		0.00		0.00		
Land slope (%)	= 4.50		0.00		0.00		
Travel Time (min)	**= 24.85**	**+**	**0.00**	**+**	**0.00**	**=**	**24.85**
Shallow Concentrated Flow							
Flow length (ft)	= 43.09		0.00		0.00		
Watercourse slope (%)	= 3.83		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=3.98		0.00		0.00		
Travel Time (min)	**= 0.18**	**+**	**0.00**	**+**	**0.00**	**=**	**0.18**
Channel Flow							
X sectional flow area (sqft)	= 0.20		0.00		0.00		
Wetted perimeter (ft)	= 1.57		0.00		0.00		
Channel slope (%)	= 4.17		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=6.96						
			0.00				
					0.00		
Flow length (ft)	({0})286.0		0.0		0.0		
Travel Time (min)	**= 0.69**	**+**	**0.00**	**+**	**0.00**	**=**	**0.69**

Total Travel Time, Tc ..... **25.70 min**

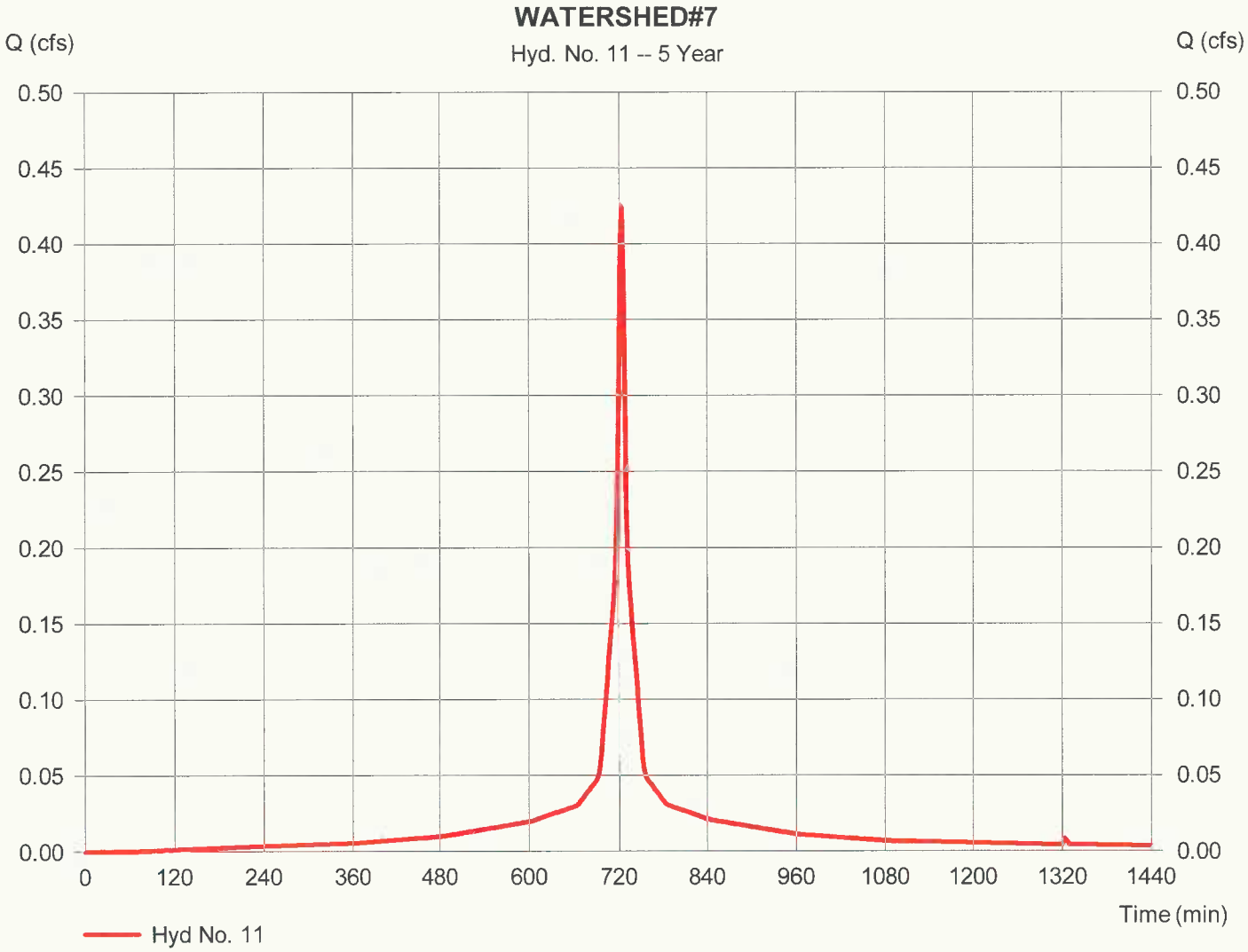
Hydrograph Report

Hyd. No. 11

WATERSHED#7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.424 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,447 cuft
Drainage area	= 0.110 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.106 x 98)] / 0.110



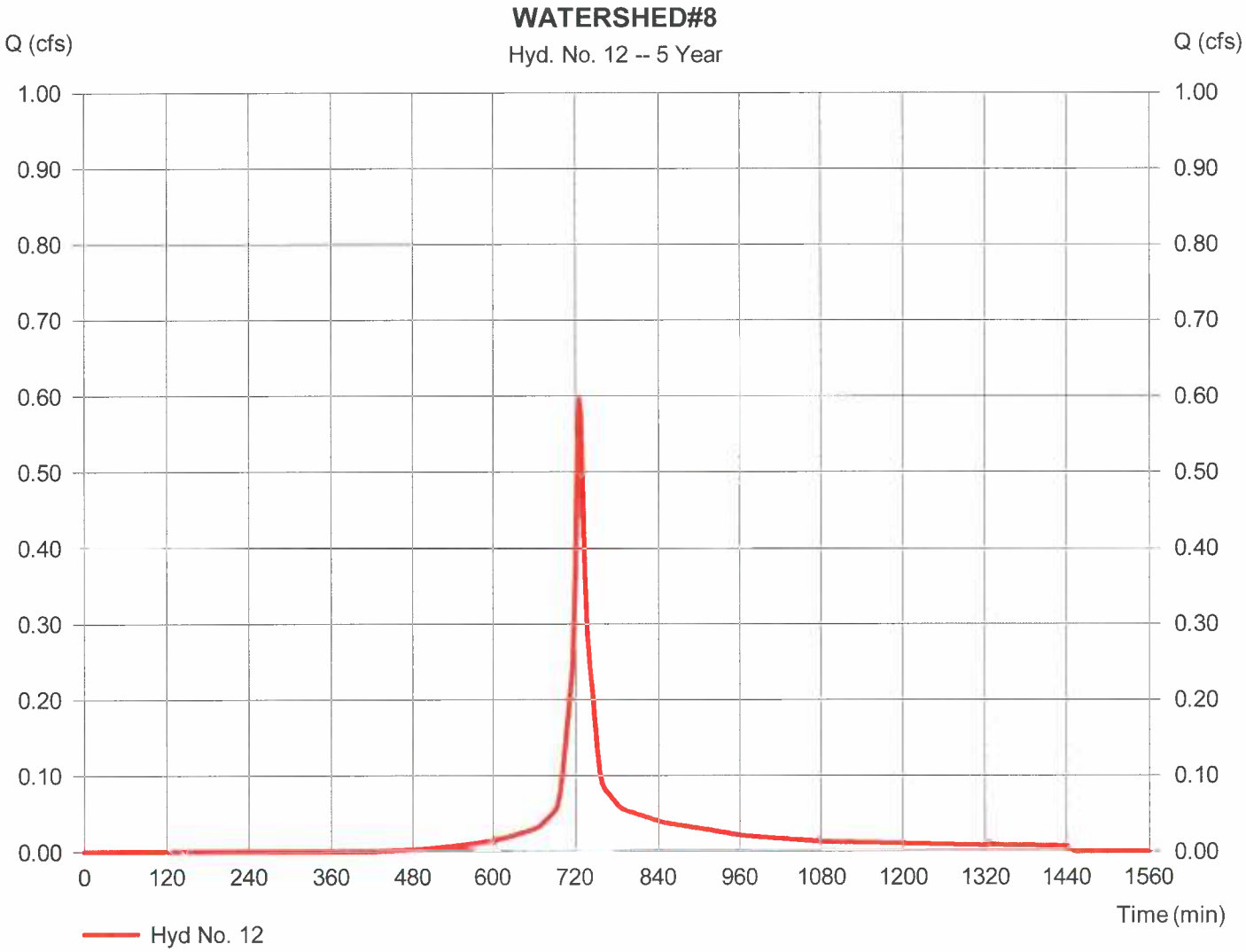
Hydrograph Report

Hyd. No. 12

WATERSHED#8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.594 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,034 cuft
Drainage area	= 0.220 ac	Curve number	= 85*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.060 x 98) + (0.080 x 98) + (0.080 x 61)] / 0.220



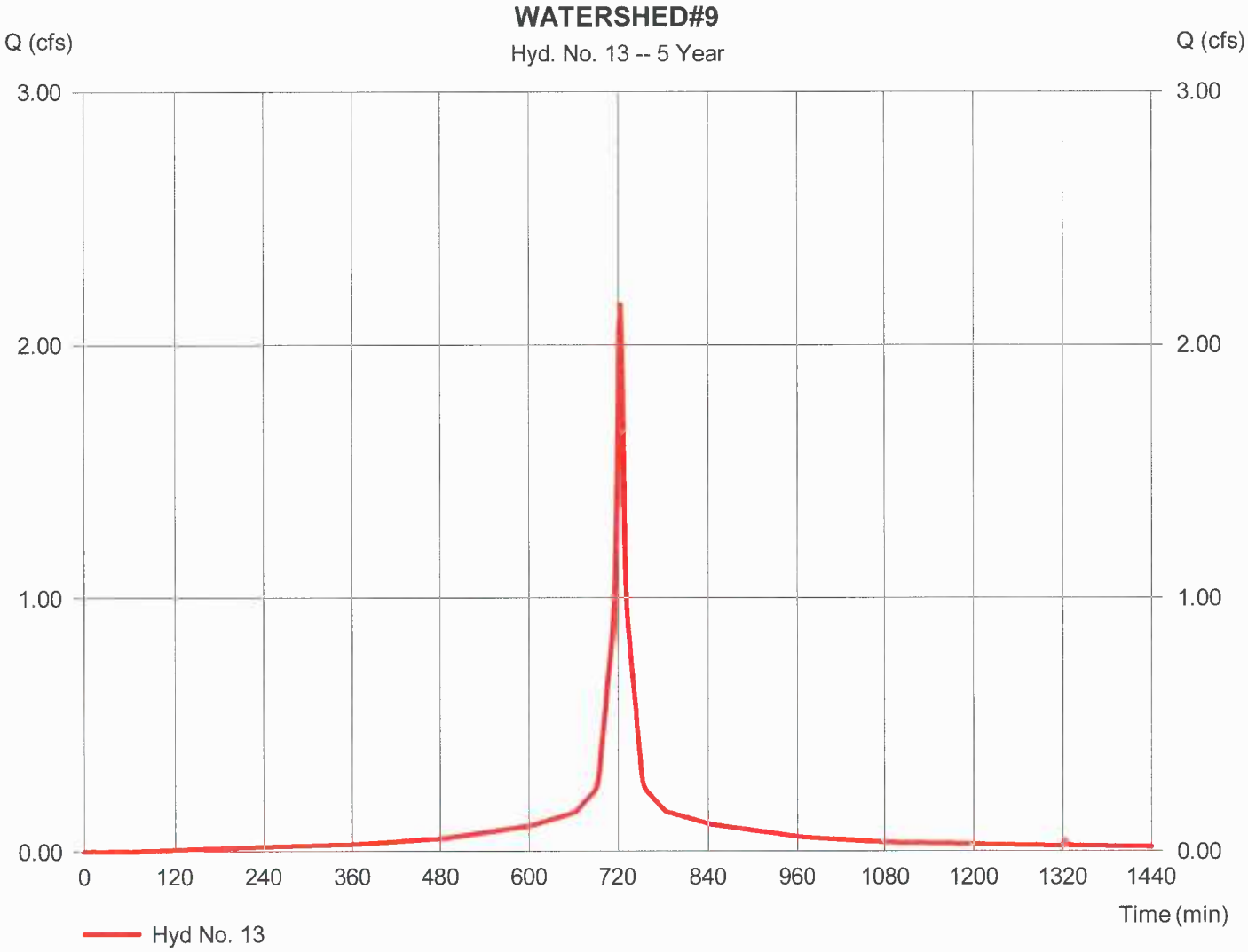
Hydrograph Report

Hyd. No. 13

WATERSHED#9

Hydrograph type	= SCS Runoff	Peak discharge	= 2.159 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 7,365 cuft
Drainage area	= 0.560 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.490 x 98) + (0.070 x 98)] / 0.560



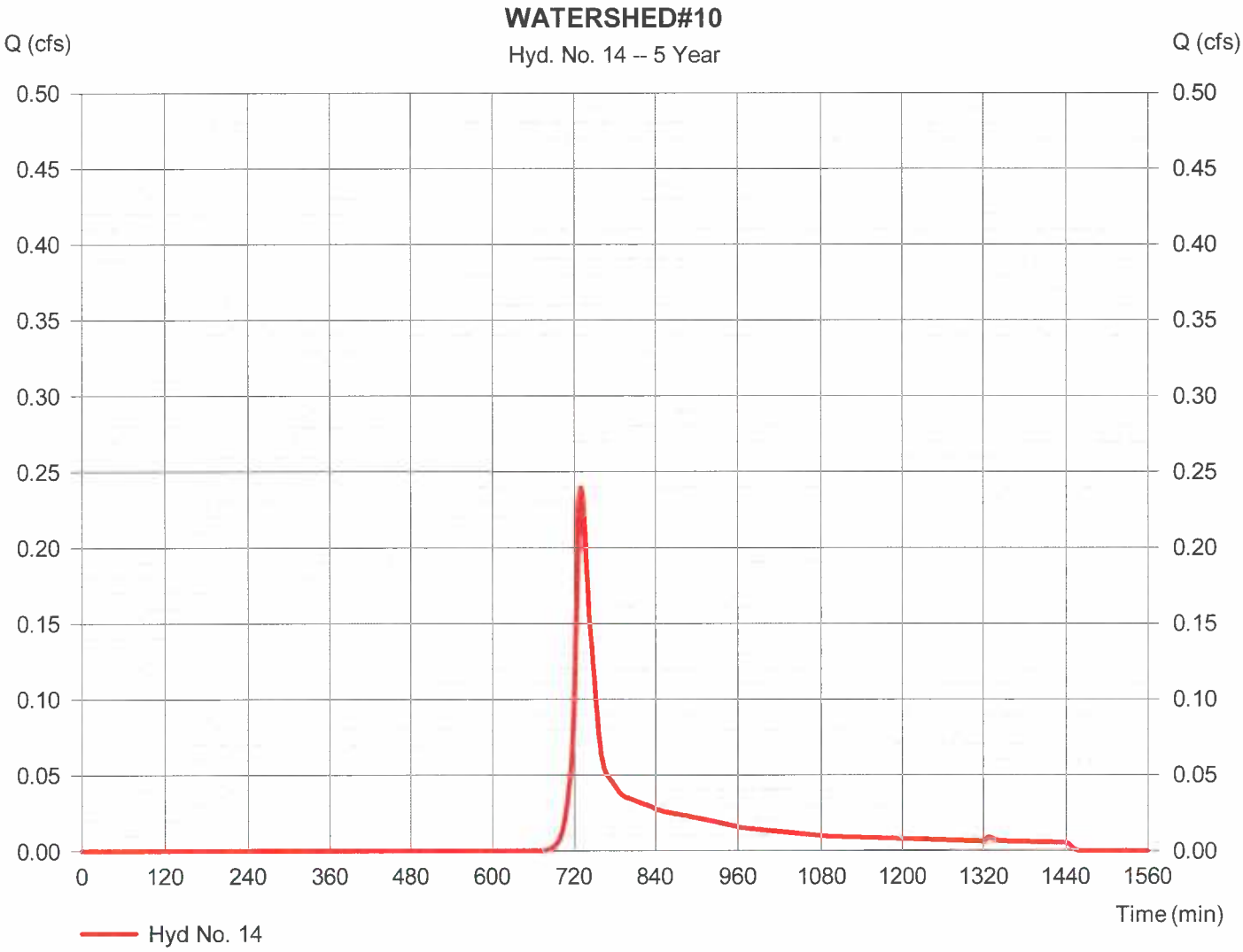
Hydrograph Report

Hyd. No. 14

WATERSHED#10

Hydrograph type	= SCS Runoff	Peak discharge	= 0.239 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,017 cuft
Drainage area	= 0.250 ac	Curve number	= 65*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 98) + (0.220 x 61)] / 0.250



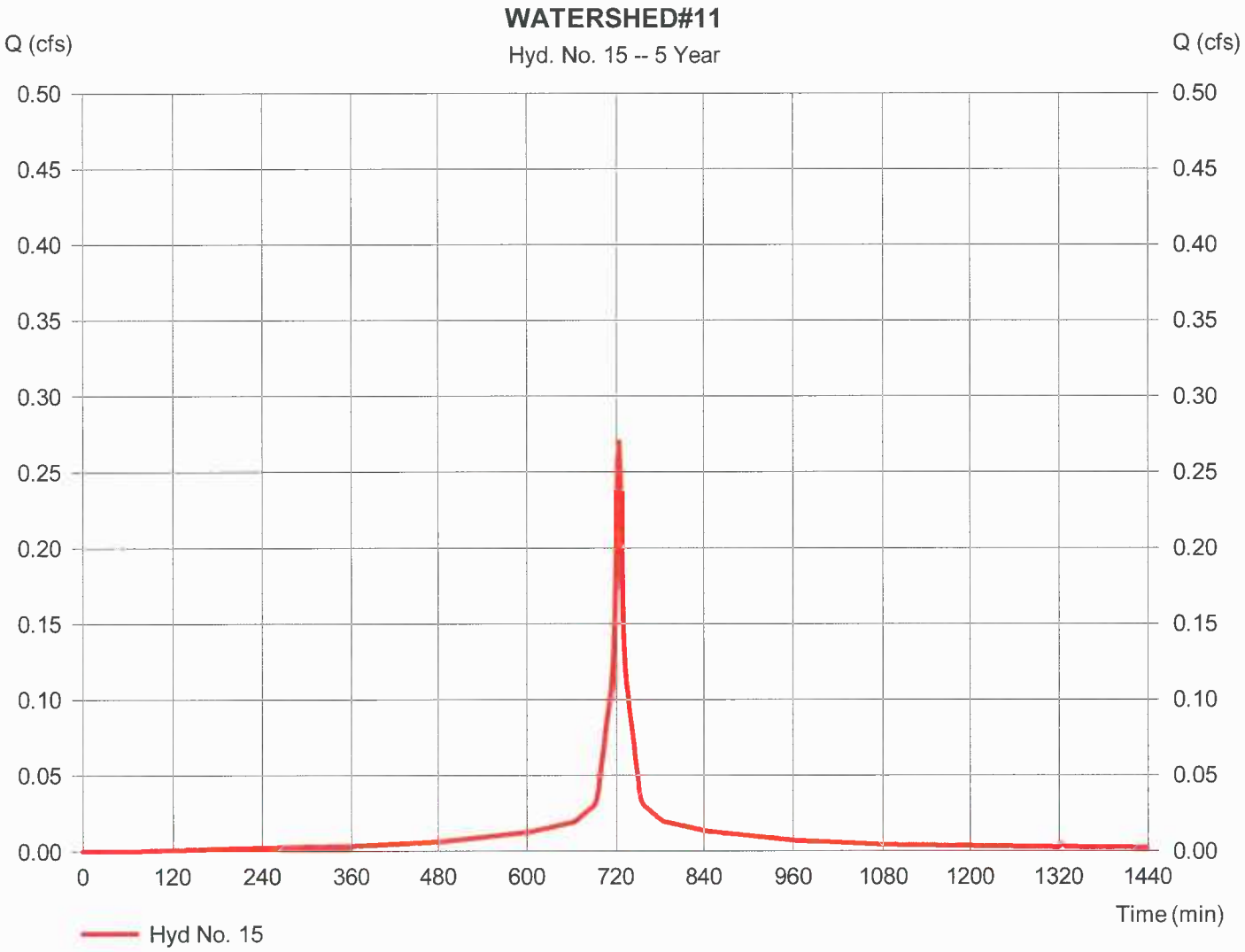
Hydrograph Report

Hyd. No. 15

WATERSHED#11

Hydrograph type	= SCS Runoff	Peak discharge	= 0.270 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 921 cuft
Drainage area	= 0.070 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.072 x 98)] / 0.070

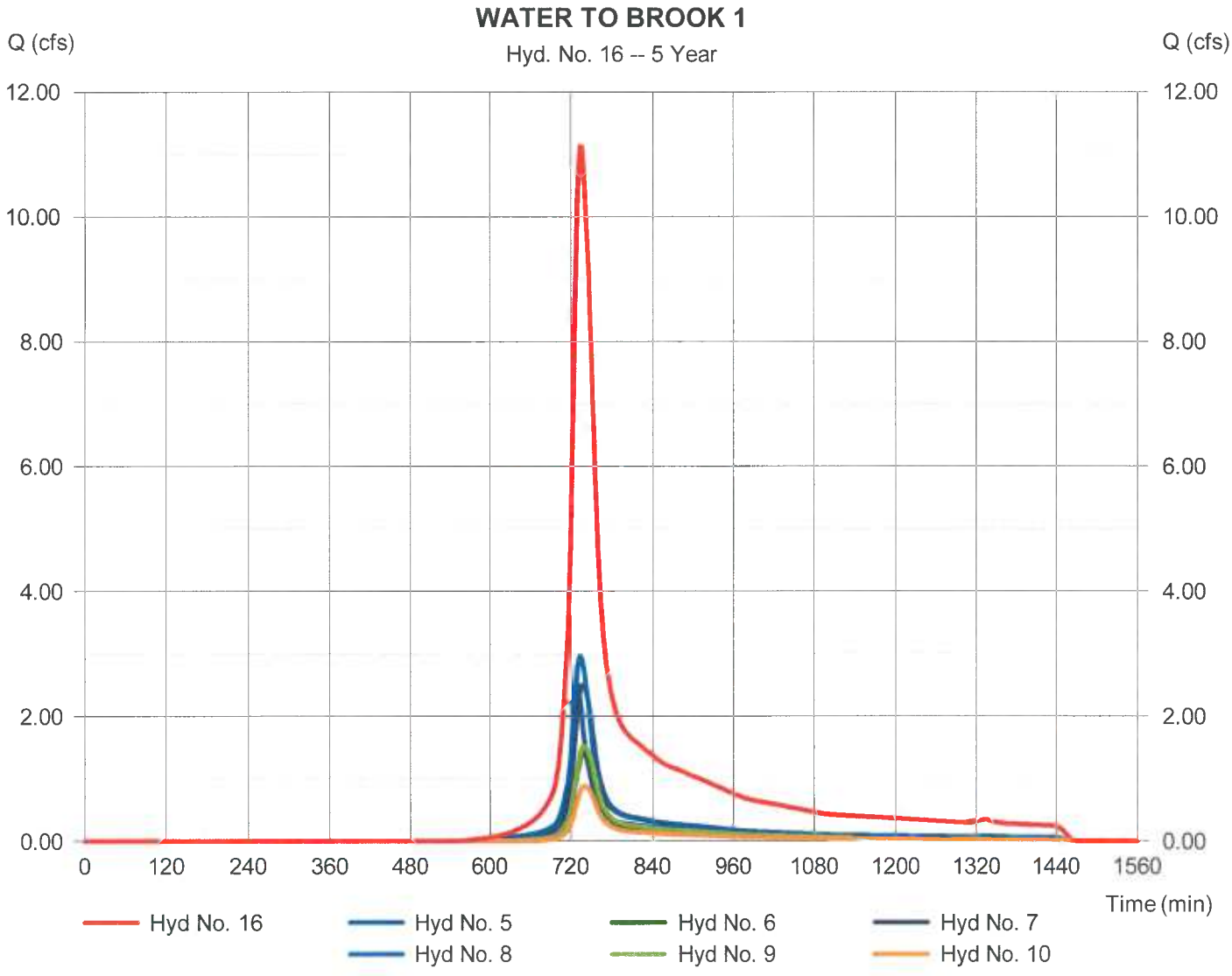


Hydrograph Report

Hyd. No. 16

WATER TO BROOK 1

Hydrograph type	= Combine	Peak discharge	= 11.12 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 54,591 cuft
Inflow hyds.	= 5, 6, 7, 8, 9, 10	Contrib. drain. area	= 9.250 ac

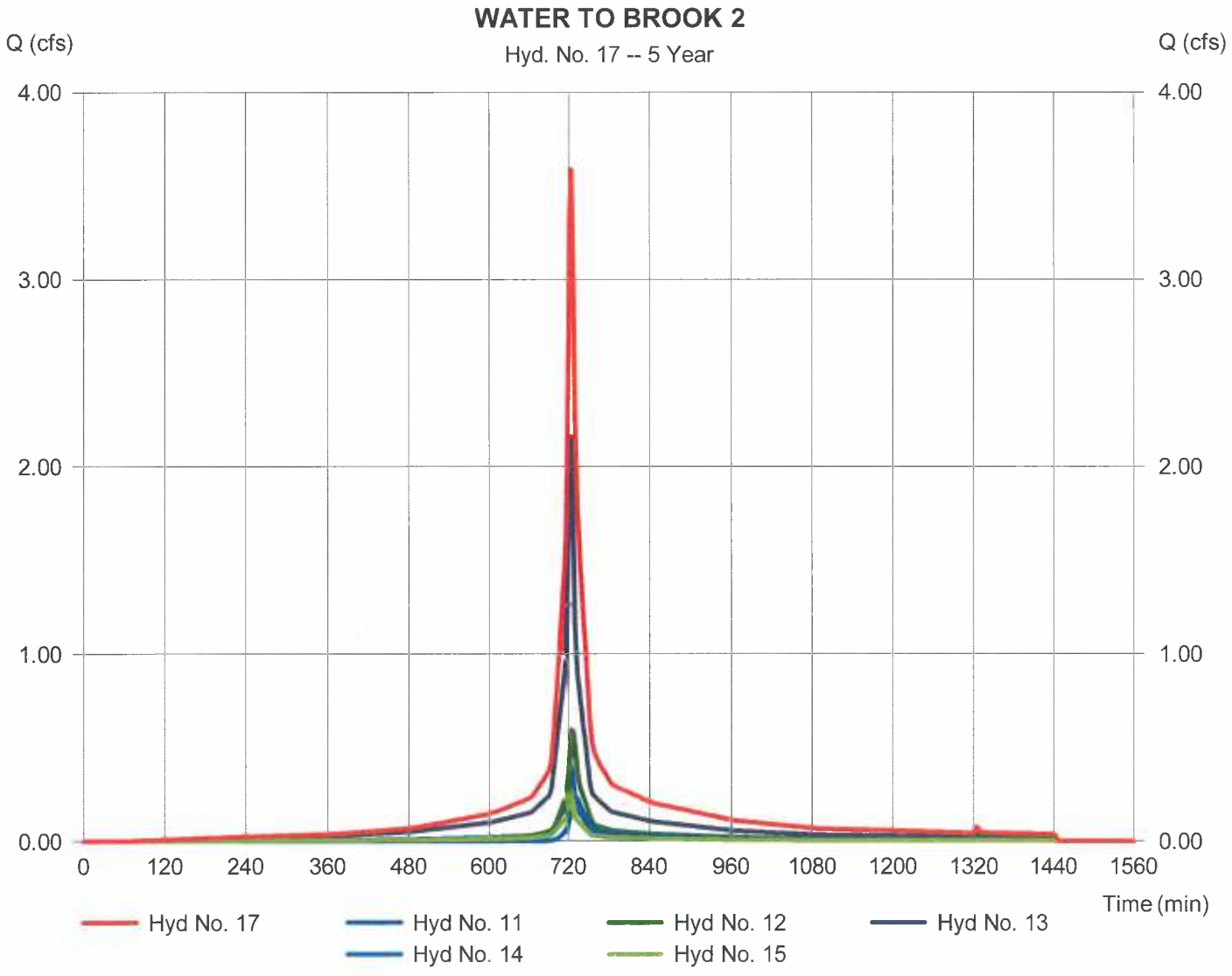


Hydrograph Report

Hyd. No. 17

WATER TO BROOK 2

Hydrograph type	= Combine	Peak discharge	= 3.585 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 12,785 cuft
Inflow hyds.	= 11, 12, 13, 14, 15	Contrib. drain. area	= 1.210 ac

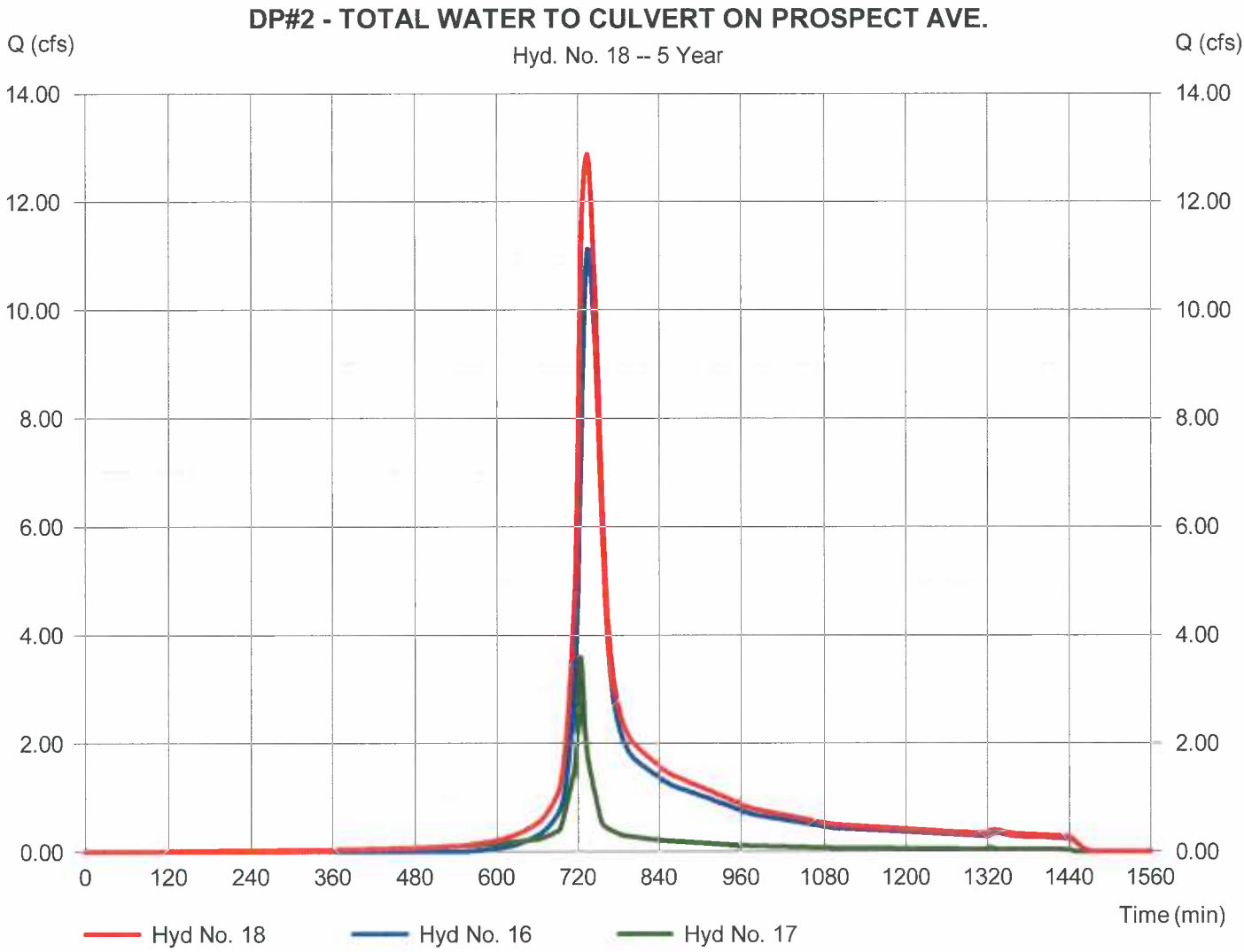


Hydrograph Report

Hyd. No. 18

DP#2 - TOTAL WATER TO CULVERT ON PROSPECT AVE.

Hydrograph type	= Combine	Peak discharge	= 12.88 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 67,375 cuft
Inflow hyds.	= 16, 17	Contrib. drain. area	= 0.000 ac

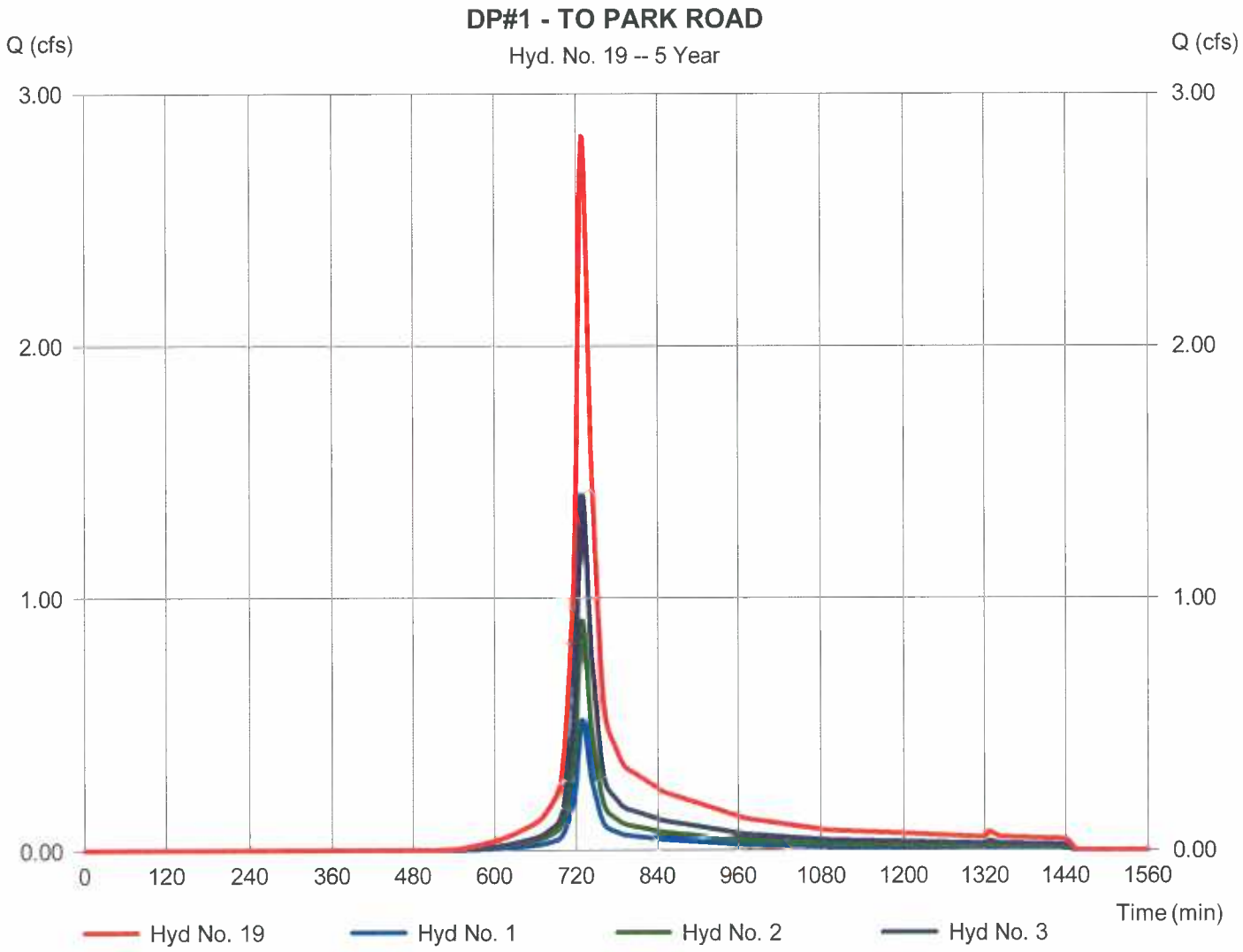


Hydrograph Report

Hyd. No. 19

DP#1 - TO PARK ROAD

Hydrograph type	= Combine	Peak discharge	= 2.832 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 10,937 cuft
Inflow hyds.	= 1, 2, 3	Contrib. drain. area	= 1.480 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.647	2	728	2,485	------	------	------	TO EX. CATCHBASIN3
2	SCS Runoff	1.131	2	728	4,337	------	------	------	TO EX. CATHBASIN2
3	SCS Runoff	1.779	2	728	6,843	------	------	------	TO EX. CATCHBASIN1
4	SCS Runoff	0.177	2	730	690	------	------	------	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	3.164	2	728	12,175	------	------	------	WATERSHED#1
6	SCS Runoff	1.789	2	738	8,894	------	------	------	WATERSHED#2
7	SCS Runoff	3.294	2	736	15,943	------	------	------	WATERSHED#3
8	SCS Runoff	3.740	2	734	16,546	------	------	------	WATERSHED#4
9	SCS Runoff	2.000	2	738	10,076	------	------	------	WATERSHED#5
10	SCS Runoff	1.186	2	740	6,084	------	------	------	WATERSHED#6
11	SCS Runoff	0.487	2	724	1,671	------	------	------	WATERSHED#7
12	SCS Runoff	0.718	2	726	2,469	------	------	------	WATERSHED#8
13	SCS Runoff	2.480	2	724	8,507	------	------	------	WATERSHED#9
14	SCS Runoff	0.334	2	730	1,364	------	------	------	WATERSHED#10
15	SCS Runoff	0.310	2	724	1,063	------	------	------	WATERSHED#11
16	Combine	14.40	2	734	69,718	5, 6, 7, 8, 9, 10,	------	------	WATER TO BROOK 1
17	Combine	4.206	2	724	15,074	11, 12, 13, 14, 15,	------	------	WATER TO BROOK 2
18	Combine	16.49	2	734	84,792	16, 17	------	------	DP#2 - TOTAL WATER TO CULVER
19	Combine	3.557	2	728	13,665	1, 2, 3,	------	------	DP#1 - TO PARK ROAD

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.828	2	728	3,175	------	------	------	TO EX. CATCHBASIN3
2	SCS Runoff	1.432	2	728	5,490	------	------	------	TO EX. CATHBASIN2
3	SCS Runoff	2.291	2	728	8,781	------	------	------	TO EX. CATCHBASIN1
4	SCS Runoff	0.234	2	728	903	------	------	------	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	4.076	2	728	15,624	------	------	------	WATERSHED#1
6	SCS Runoff	2.346	2	738	11,577	------	------	------	WATERSHED#2
7	SCS Runoff	4.413	2	736	21,072	------	------	------	WATERSHED#3
8	SCS Runoff	4.807	2	734	21,233	------	------	------	WATERSHED#4
9	SCS Runoff	2.679	2	738	13,318	------	------	------	WATERSHED#5
10	SCS Runoff	1.625	2	738	8,176	------	------	------	WATERSHED#6
11	SCS Runoff	0.571	2	724	1,970	------	------	------	WATERSHED#7
12	SCS Runoff	0.884	2	726	3,061	------	------	------	WATERSHED#8
13	SCS Runoff	2.907	2	724	10,029	------	------	------	WATERSHED#9
14	SCS Runoff	0.470	2	730	1,867	------	------	------	WATERSHED#10
15	SCS Runoff	0.363	2	724	1,254	------	------	------	WATERSHED#11
16	Combine	18.98	2	734	91,000	5, 6, 7,	------	------	WATER TO BROOK 1
17	Combine	5.043	2	724	18,180	8, 9, 10, 11, 12, 13,	------	------	WATER TO BROOK 2
18	Combine	21.51	2	734	109,180	14, 15, 16, 17	------	------	DP#2 - TOTAL WATER TO CULVER
19	Combine	4.551	2	728	17,446	1, 2, 3,	------	------	DP#1 - TO PARK ROAD

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.990	2	728	3,796	------	------	------	TO EX. CATCHBASIN3
2	SCS Runoff	1.698	2	728	6,526	------	------	------	TO EX. CATHBASIN2
3	SCS Runoff	2.748	2	728	10,533	------	------	------	TO EX. CATCHBASIN1
4	SCS Runoff	0.286	2	728	1,097	------	------	------	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	4.890	2	728	18,741	------	------	------	WATERSHED#1
6	SCS Runoff	2.848	2	738	14,021	------	------	------	WATERSHED#2
7	SCS Runoff	5.432	2	736	25,784	------	------	------	WATERSHED#3
8	SCS Runoff	5.759	2	734	25,469	------	------	------	WATERSHED#4
9	SCS Runoff	3.298	2	738	16,296	------	------	------	WATERSHED#5
10	SCS Runoff	2.032	2	738	10,115	------	------	------	WATERSHED#6
11	SCS Runoff	0.644	2	724	2,232	------	------	------	WATERSHED#7
12	SCS Runoff	1.030	2	726	3,587	------	------	------	WATERSHED#8
13	SCS Runoff	3.280	2	724	11,361	------	------	------	WATERSHED#9
14	SCS Runoff	0.596	2	730	2,338	------	------	------	WATERSHED#10
15	SCS Runoff	0.410	2	724	1,420	------	------	------	WATERSHED#11
16	Combine	23.11	2	734	110,427	5, 6, 7, 8, 9, 10,	------	------	WATER TO BROOK 1
17	Combine	5.783	2	724	20,938	11, 12, 13, 14, 15,	------	------	WATER TO BROOK 2
18	Combine	26.04	2	734	131,365	16, 17	------	------	DP#2 - TOTAL WATER TO CULVER
19	Combine	5.436	2	728	20,856	1, 2, 3,	------	------	DP#1 - TO PARK ROAD

Hydrograph Summary Report

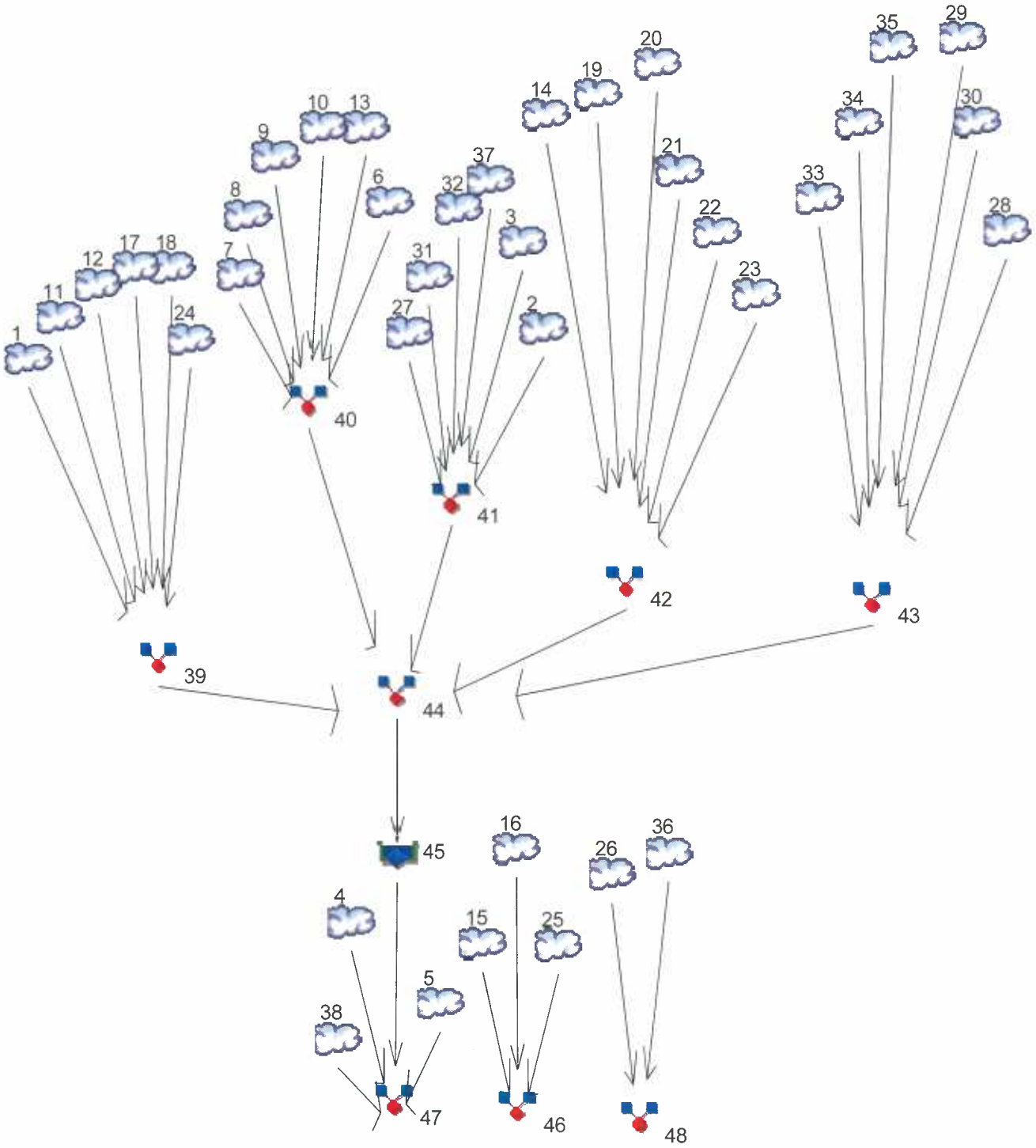
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.153	2	728	4,431	------	------	------	TO EX. CATCHBASIN3
2	SCS Runoff	1.966	2	728	7,580	------	------	------	TO EX. CATHBASIN2
3	SCS Runoff	3.212	2	728	12,325	------	------	------	TO EX. CATCHBASIN1
4	SCS Runoff	0.338	2	728	1,297	------	------	------	DP#3 - PROSPECT AVE CATCHBA
5	SCS Runoff	5.714	2	728	21,930	------	------	------	WATERSHED#1
6	SCS Runoff	3.359	2	738	16,535	------	------	------	WATERSHED#2
7	SCS Runoff	6.477	2	736	30,659	------	------	------	WATERSHED#3
8	SCS Runoff	6.729	2	732	29,802	------	------	------	WATERSHED#4
9	SCS Runoff	3.933	2	738	19,377	------	------	------	WATERSHED#5
10	SCS Runoff	2.453	2	738	12,135	------	------	------	WATERSHED#6
11	SCS Runoff	0.718	2	724	2,494	------	------	------	WATERSHED#7
12	SCS Runoff	1.175	2	726	4,118	------	------	------	WATERSHED#8
13	SCS Runoff	3.653	2	724	12,694	------	------	------	WATERSHED#9
14	SCS Runoff	0.728	2	730	2,831	------	------	------	WATERSHED#10
15	SCS Runoff	0.457	2	724	1,587	------	------	------	WATERSHED#11
16	Combine	27.34	2	734	130,438	5, 6, 7, 8, 9, 10,	------	------	WATER TO BROOK 1
17	Combine	6.528	2	724	23,724	11, 12, 13, 14, 15,	------	------	WATER TO BROOK 2
18	Combine	30.66	2	732	154,162	16, 17	------	------	DP#2 - TOTAL WATER TO CULVER
19	Combine	6.330	2	728	24,337	1, 2, 3,	------	------	DP#1 - TO PARK ROAD

APPENDIX B
Watershed Computations
(Post-Development Conditions)

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10



Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.070	-------	0.098	0.116	0.140	0.160	0.181	CB-1
2	SCS Runoff	------	-------	0.101	-------	0.137	0.161	0.193	0.220	0.248	CB-2
3	SCS Runoff	------	-------	2.577	-------	3.356	3.872	4.559	5.157	5.754	SOUTH PARKING AREA
4	SCS Runoff	------	-------	1.177	-------	1.782	2.199	2.764	3.264	3.765	W.A.# 3
5	SCS Runoff	------	-------	0.614	-------	1.022	1.313	1.724	2.095	2.473	W.A.# 4
6	SCS Runoff	------	-------	0.226	-------	0.297	0.344	0.406	0.460	0.514	CB-3
7	SCS Runoff	------	-------	0.169	-------	0.237	0.282	0.343	0.396	0.448	CB-4
8	SCS Runoff	------	-------	1.076	-------	1.423	1.653	1.957	2.222	2.487	CB-5
9	SCS Runoff	------	-------	0.599	-------	0.805	0.942	1.124	1.282	1.440	CB-6
10	SCS Runoff	------	-------	0.386	-------	0.511	0.593	0.703	0.798	0.893	CB-7
11	SCS Runoff	------	-------	0.180	-------	0.231	0.266	0.311	0.351	0.391	CB-8
12	SCS Runoff	------	-------	0.295	-------	0.394	0.459	0.545	0.620	0.695	CB-9
13	SCS Runoff	------	-------	0.277	-------	0.376	0.442	0.529	0.605	0.681	TD-2
14	SCS Runoff	------	-------	0.154	-------	0.227	0.277	0.345	0.404	0.464	Sisters Courtyard
15	SCS Runoff	------	-------	0.151	-------	0.205	0.241	0.289	0.330	0.371	W.A.# 5
16	SCS Runoff	------	-------	0.293	-------	0.472	0.600	0.778	0.937	1.099	W.A.# 6
17	SCS Runoff	------	-------	0.546	-------	0.858	1.079	1.381	1.650	1.922	W.A.# 1
18	SCS Runoff	------	-------	0.566	-------	0.743	0.860	1.015	1.150	1.285	CB-10
19	SCS Runoff	------	-------	0.497	-------	0.657	0.763	0.903	1.026	1.148	CB-11
20	SCS Runoff	------	-------	0.564	-------	0.751	0.876	1.041	1.184	1.327	CB-12
21	SCS Runoff	------	-------	0.212	-------	0.296	0.353	0.429	0.494	0.560	CB-13
22	SCS Runoff	------	-------	0.226	-------	0.297	0.344	0.406	0.460	0.514	TD-3
23	SCS Runoff	------	-------	0.594	-------	0.823	0.976	1.180	1.357	1.533	TD-1
24	SCS Runoff	------	-------	3.364	-------	4.353	5.010	5.884	6.647	7.409	W.A.# 11
25	SCS Runoff	------	-------	0.044	-------	0.068	0.084	0.106	0.126	0.146	W.A.# 7
26	SCS Runoff	------	-------	0.075	-------	0.112	0.137	0.172	0.202	0.233	W.A.# 8
27	SCS Runoff	------	-------	0.809	-------	1.041	1.196	1.402	1.581	1.761	GARAGE ROOF DRAIN-2
28	SCS Runoff	------	-------	1.018	-------	1.311	1.506	1.765	1.992	2.218	GARAGE ROOF DRAIN-1
29	SCS Runoff	------	-------	0.809	-------	1.041	1.196	1.402	1.581	1.761	GARAGE ROOF DRAIN-3
30	SCS Runoff	------	-------	1.557	-------	2.005	2.303	2.699	3.046	3.392	GARAGE ROOF DRAIN-4
31	SCS Runoff	------	-------	0.485	-------	0.745	0.926	1.171	1.389	1.608	W.A.# 10
32	SCS Runoff	------	-------	0.049	-------	0.076	0.096	0.123	0.147	0.171	YD-1
33	SCS Runoff	------	-------	0.077	-------	0.128	0.164	0.215	0.262	0.309	YD-2
34	SCS Runoff	------	-------	0.065	-------	0.105	0.133	0.173	0.208	0.244	YD-3

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
35	SCS Runoff	------	-------	0.097	-------	0.153	0.192	0.245	0.293	0.342	YD-4
36	SCS Runoff	------	-------	0.030	-------	0.039	0.044	0.052	0.059	0.065	W.A.# 9
37	SCS Runoff	------	-------	2.625	-------	3.675	4.378	5.314	6.131	6.944	DETENTION POND AREA
38	SCS Runoff	------	-------	1.906	-------	3.227	4.174	5.512	6.728	7.970	W.A.# 2
39	Combine	1, 11, 12,	-------	4.911	-------	6.521	7.601	9.045	10.31	11.58	To S. Pond (A)
40	Combine	17, 18, 24, 6, 7, 8,	-------	2.724	-------	3.636	4.241	5.044	5.742	6.439	S. POND COMBINE (B)
41	Combine	9, 10, 13, 2, 3, 27,	-------	6.378	-------	8.673	10.21	12.26	14.06	15.86	To S. Pond (C)
42	Combine	31, 32, 37, 14, 19, 20,	-------	2.185	-------	2.973	3.498	4.197	4.806	5.414	S. POND COMBINE (D)
43	Combine	21, 22, 23, 28, 29, 30,	-------	3.571	-------	4.669	5.405	6.391	7.255	8.121	S. POND COMBINE (E)
44	Combine	33, 34, 35, 39, 40, 41,	-------	19.77	-------	26.47	30.96	36.94	42.18	47.41	To S. Pond
45	Reservoir	42, 43 44	-------	3.996	-------	5.400	6.170	7.095	7.829	8.873	S. Pond Overflow
46	Combine	15, 16, 25,	-------	0.448	-------	0.692	0.863	1.098	1.307	1.519	DP#1 - To Park Road
47	Combine	4, 5, 38,	-------	6.758	-------	10.46	12.75	15.83	18.56	21.24	DP#2 - To Culvert
48	Combine	45, 26, 36,	-------	0.097	-------	0.140	0.169	0.209	0.245	0.280	DP#3 - To Prospect

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.098	2	724	298	------	------	------	CB-1
2	SCS Runoff	0.137	2	724	424	------	------	------	CB-2
3	SCS Runoff	3.356	2	724	11,022	------	------	------	SOUTH PARKING AREA
4	SCS Runoff	1.782	2	726	6,085	------	------	------	W.A.# 3
5	SCS Runoff	1.022	2	730	4,001	------	------	------	W.A.# 4
6	SCS Runoff	0.297	2	724	961	------	------	------	CB-3
7	SCS Runoff	0.237	2	726	819	------	------	------	CB-4
8	SCS Runoff	1.423	2	724	4,542	------	------	------	CB-5
9	SCS Runoff	0.805	2	724	2,516	------	------	------	CB-6
10	SCS Runoff	0.511	2	724	1,631	------	------	------	CB-7
11	SCS Runoff	0.231	2	724	789	------	------	------	CB-8
12	SCS Runoff	0.394	2	724	1,242	------	------	------	CB-9
13	SCS Runoff	0.376	2	724	1,165	------	------	------	TD-2
14	SCS Runoff	0.227	2	726	775	------	------	------	Sisters Courtyard
15	SCS Runoff	0.205	2	724	636	------	------	------	W.A.# 5
16	SCS Runoff	0.472	2	730	1,835	------	------	------	W.A.# 6
17	SCS Runoff	0.858	2	728	3,313	------	------	------	W.A.# 1
18	SCS Runoff	0.743	2	724	2,402	------	------	------	CB-10
19	SCS Runoff	0.657	2	724	2,096	------	------	------	CB-11
20	SCS Runoff	0.751	2	724	2,371	------	------	------	CB-12
21	SCS Runoff	0.296	2	726	1,024	------	------	------	CB-13
22	SCS Runoff	0.297	2	724	961	------	------	------	TD-3
23	SCS Runoff	0.823	2	726	2,859	------	------	------	TD-1
24	SCS Runoff	4.353	2	724	14,552	------	------	------	W.A.# 11
25	SCS Runoff	0.068	2	726	231	------	------	------	W.A.# 7
26	SCS Runoff	0.112	2	728	428	------	------	------	W.A.# 8
27	SCS Runoff	1.041	2	724	3,551	------	------	------	GARAGE ROOF DRAIN-2
28	SCS Runoff	1.311	2	724	4,472	------	------	------	GARAGE ROOF DRAIN-1
29	SCS Runoff	1.041	2	724	3,551	------	------	------	GARAGE ROOF DRAIN-3
30	SCS Runoff	2.005	2	724	6,839	------	------	------	GARAGE ROOF DRAIN-4
31	SCS Runoff	0.745	2	728	2,863	------	------	------	W.A.# 10
32	SCS Runoff	0.076	2	728	295	------	------	------	YD-1
33	SCS Runoff	0.128	2	730	500	------	------	------	YD-2
34	SCS Runoff	0.105	2	730	408	------	------	------	YD-3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SCS Runoff	0.153	2	728	589	------	------	------	YD-4
36	SCS Runoff	0.039	2	724	132	------	------	------	W.A.# 9
37	SCS Runoff	3.675	2	726	12,702	------	------	------	DETENTION POND AREA
38	SCS Runoff	3.227	2	730	12,695	------	------	------	W.A.# 2
39	Combine	6.521	2	724	22,596	1, 11, 12,	------	------	To S. Pond (A)
40	Combine	3.636	2	724	11,634	17, 18, 24, 6, 7, 8,	------	------	S. POND COMBINE (B)
41	Combine	8.673	2	724	30,857	9, 10, 13, 2, 3, 27,	------	------	To S. Pond (C)
42	Combine	2.973	2	724	10,087	31, 32, 37, 14, 19, 20,	------	------	S. POND COMBINE (D)
43	Combine	4.669	2	724	16,359	21, 22, 23, 28, 29, 30,	------	------	S. POND COMBINE (E)
44	Combine	26.47	2	724	91,534	33, 34, 35, 39, 40, 41,	------	------	To S. Pond
45	Reservoir	5.400	2	750	91,514	42, 43 44	45.17	41,148	S. Pond Overflow
46	Combine	0.692	2	726	2,702	15, 16, 25,	------	------	DP#1 - To Park Road
47	Combine	10.46	2	730	114,296	4, 5, 38, 45,	------	------	DP#2 - To Culvert
48	Combine	0.140	2	726	560	26, 36,	------	------	DP#3 - To Prospect

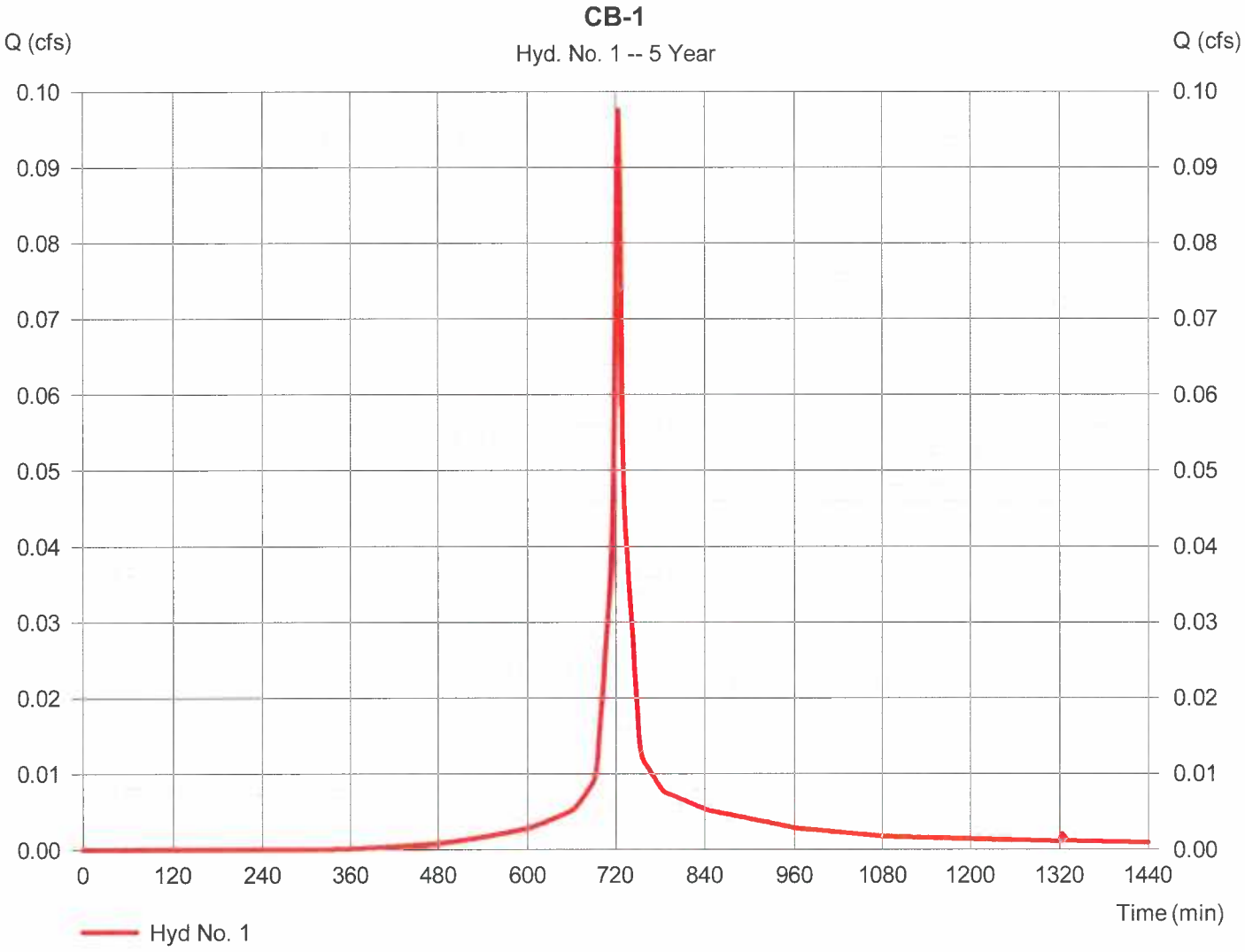
Hydrograph Report

Hyd. No. 1

CB-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.098 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 298 cuft
Drainage area	= 0.030 ac	Curve number	= 89*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = + (0.010 x 71) + (0.020 x 98)] / 0.030



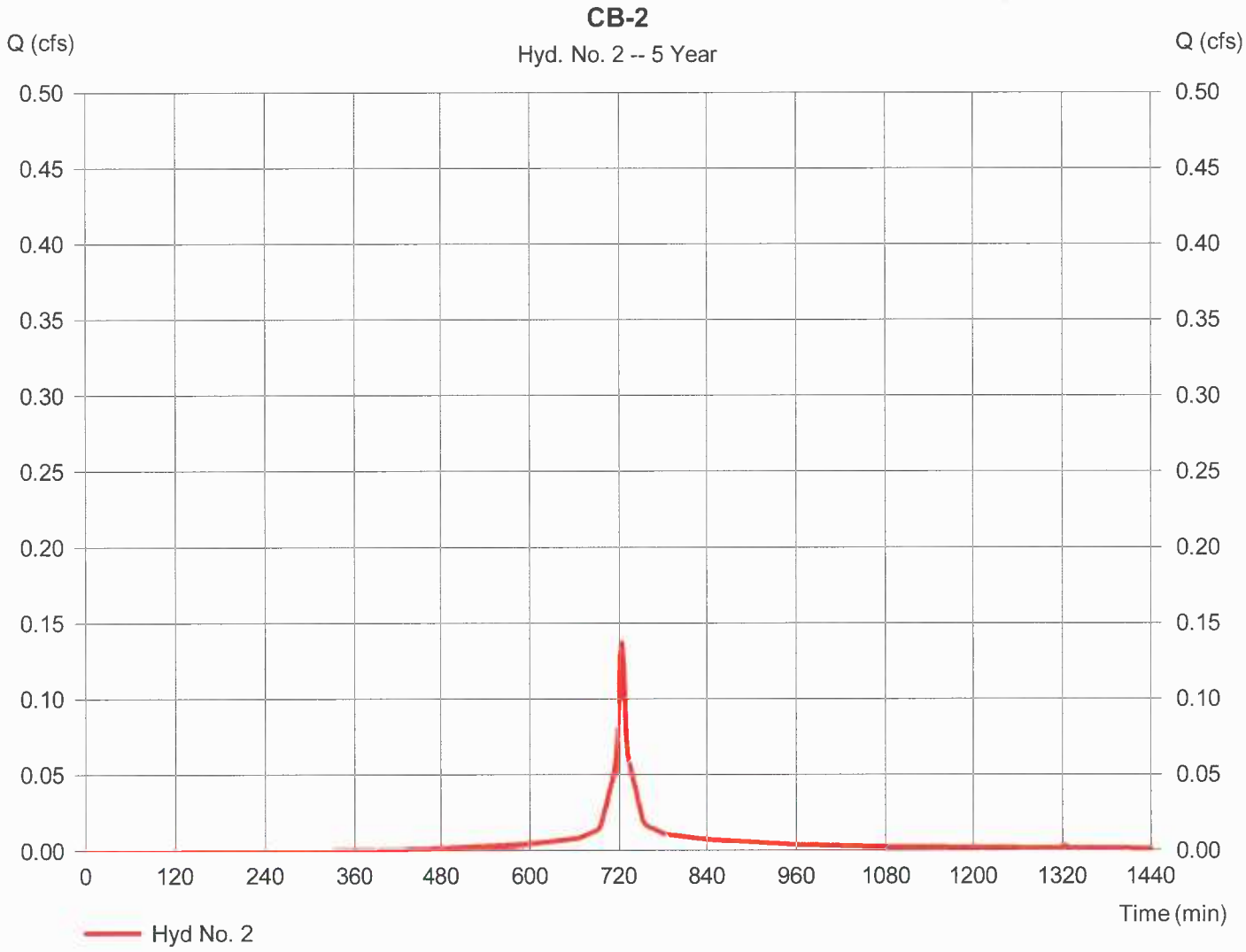
Hydrograph Report

Hyd. No. 2

CB-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.137 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 424 cuft
Drainage area	= 0.040 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 71) + (0.030 x 98)] / 0.040



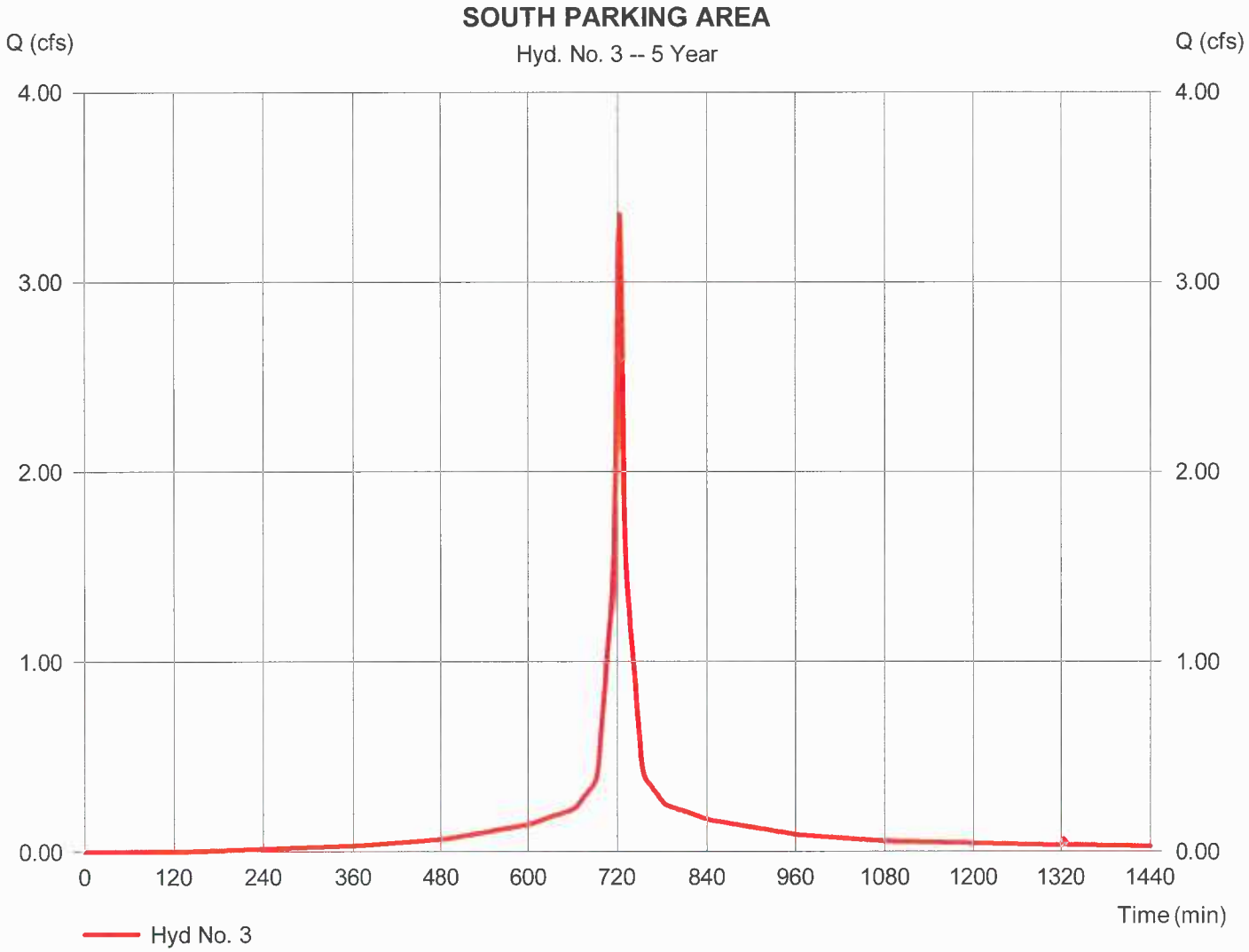
Hydrograph Report

Hyd. No. 3

SOUTH PARKING AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 3.356 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 11,022 cuft
Drainage area	= 0.890 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 74) + (0.070 x 71) + (0.810 x 98)] / 0.890



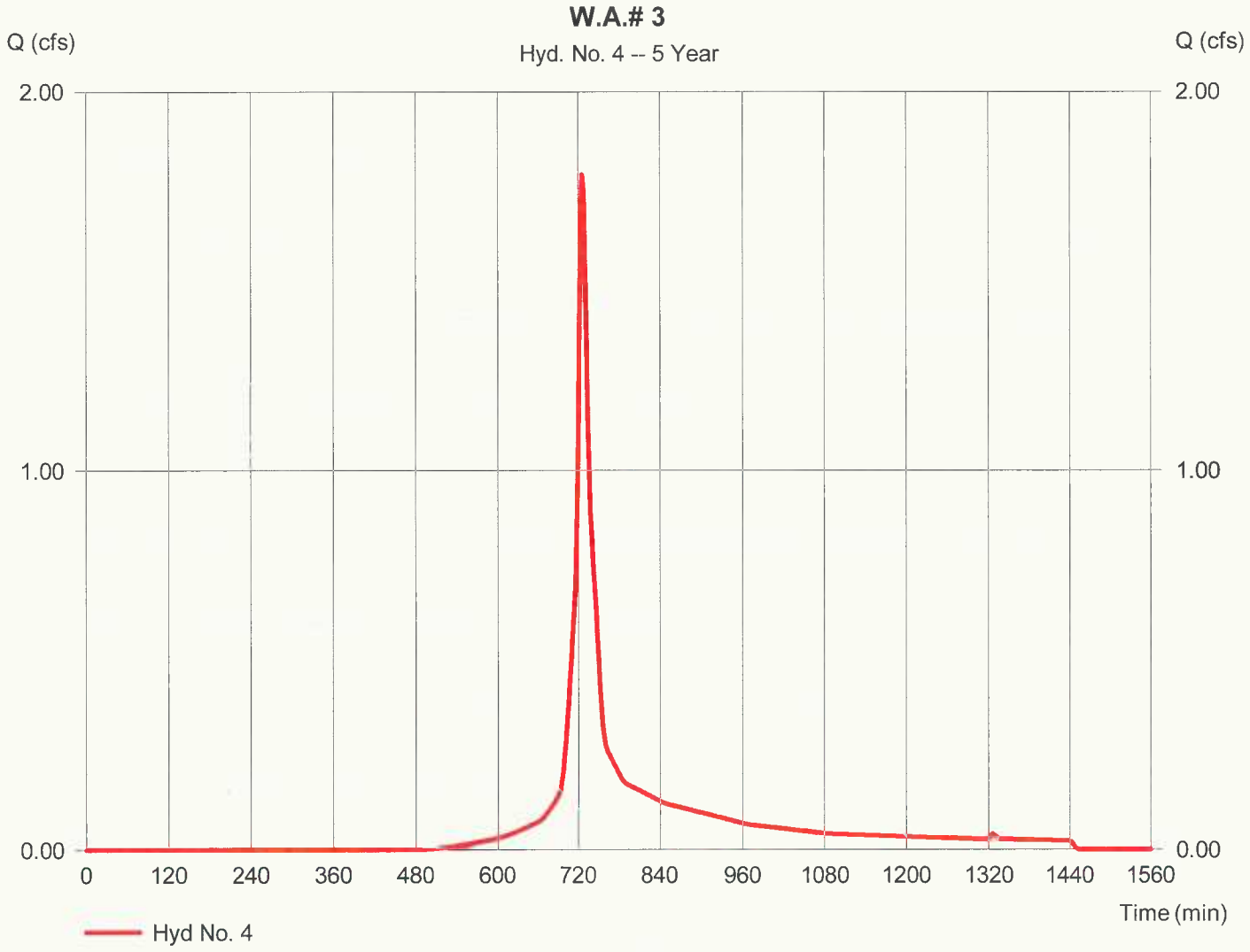
Hydrograph Report

Hyd. No. 4

W.A.# 3

Hydrograph type	= SCS Runoff	Peak discharge	= 1.782 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6,085 cuft
Drainage area	= 0.760 ac	Curve number	= 81*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.520 x 74) + (0.020 x 71) + (0.220 x 98)] / 0.760



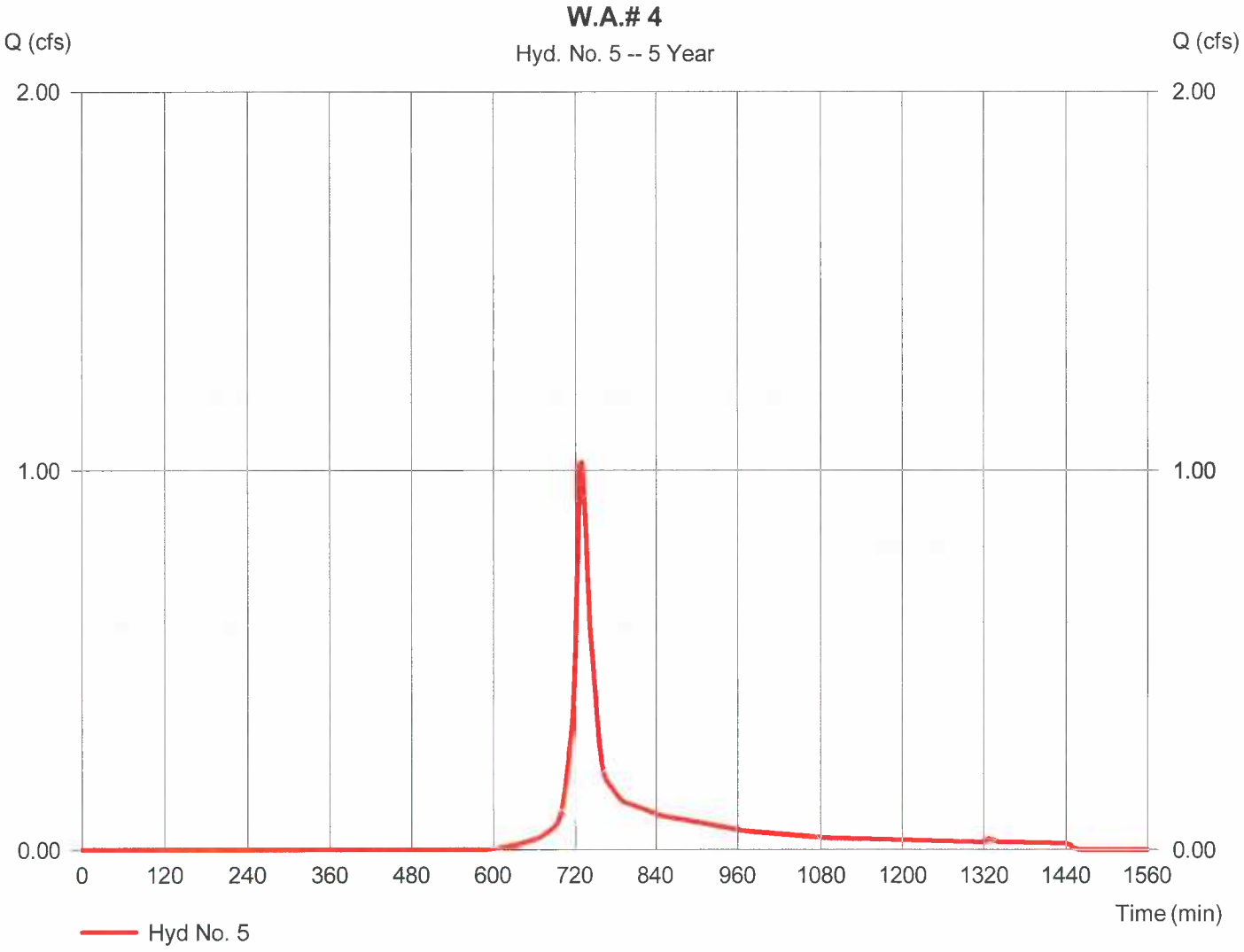
Hydrograph Report

Hyd. No. 5

W.A.# 4

Hydrograph type	= SCS Runoff	Peak discharge	= 1.022 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 4,001 cuft
Drainage area	= 0.640 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.610 x 74) + (0.030 x 80)] / 0.640



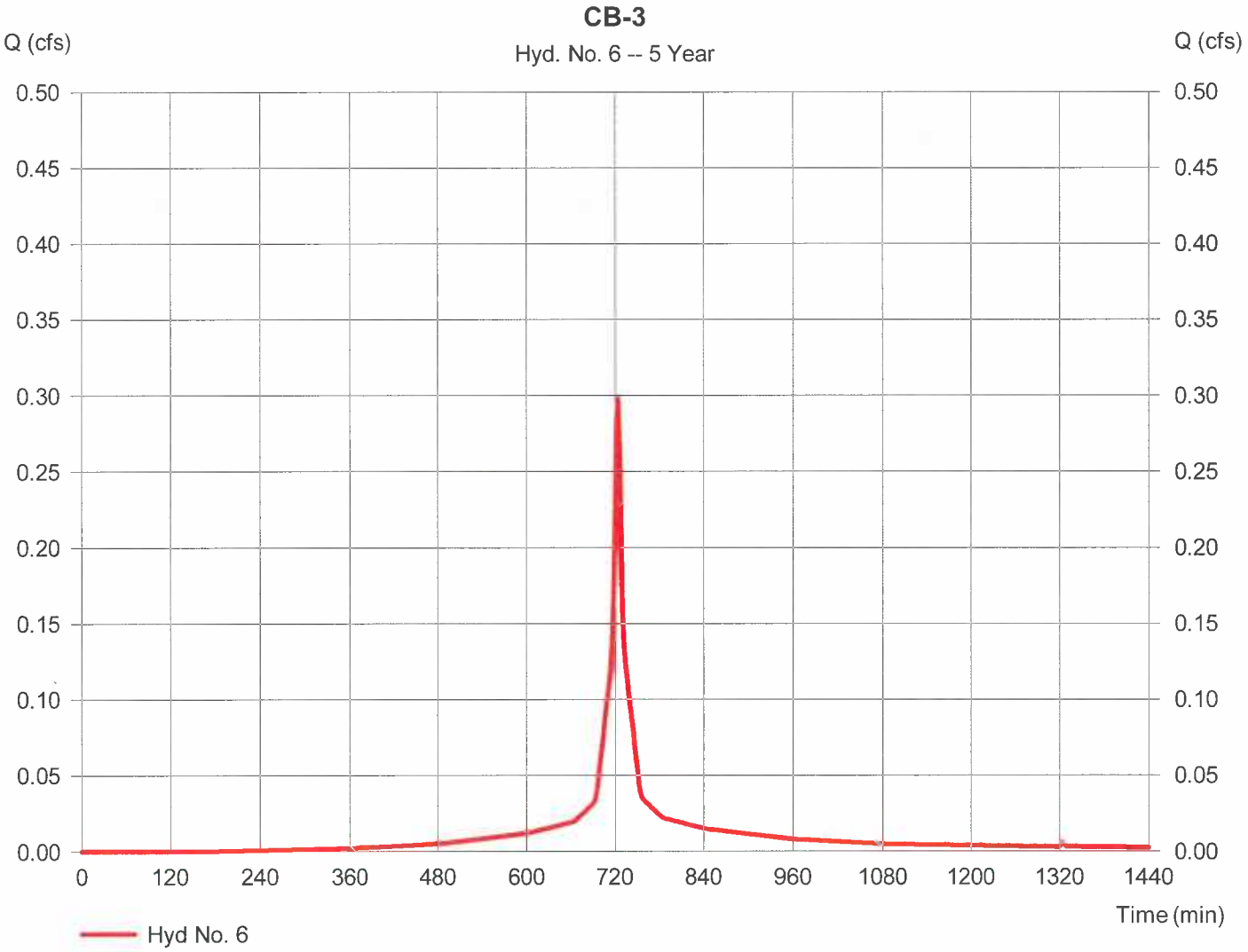
Hydrograph Report

Hyd. No. 6

CB-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.297 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 961 cuft
Drainage area	= 0.080 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 71) + (0.070 x 98)] / 0.080



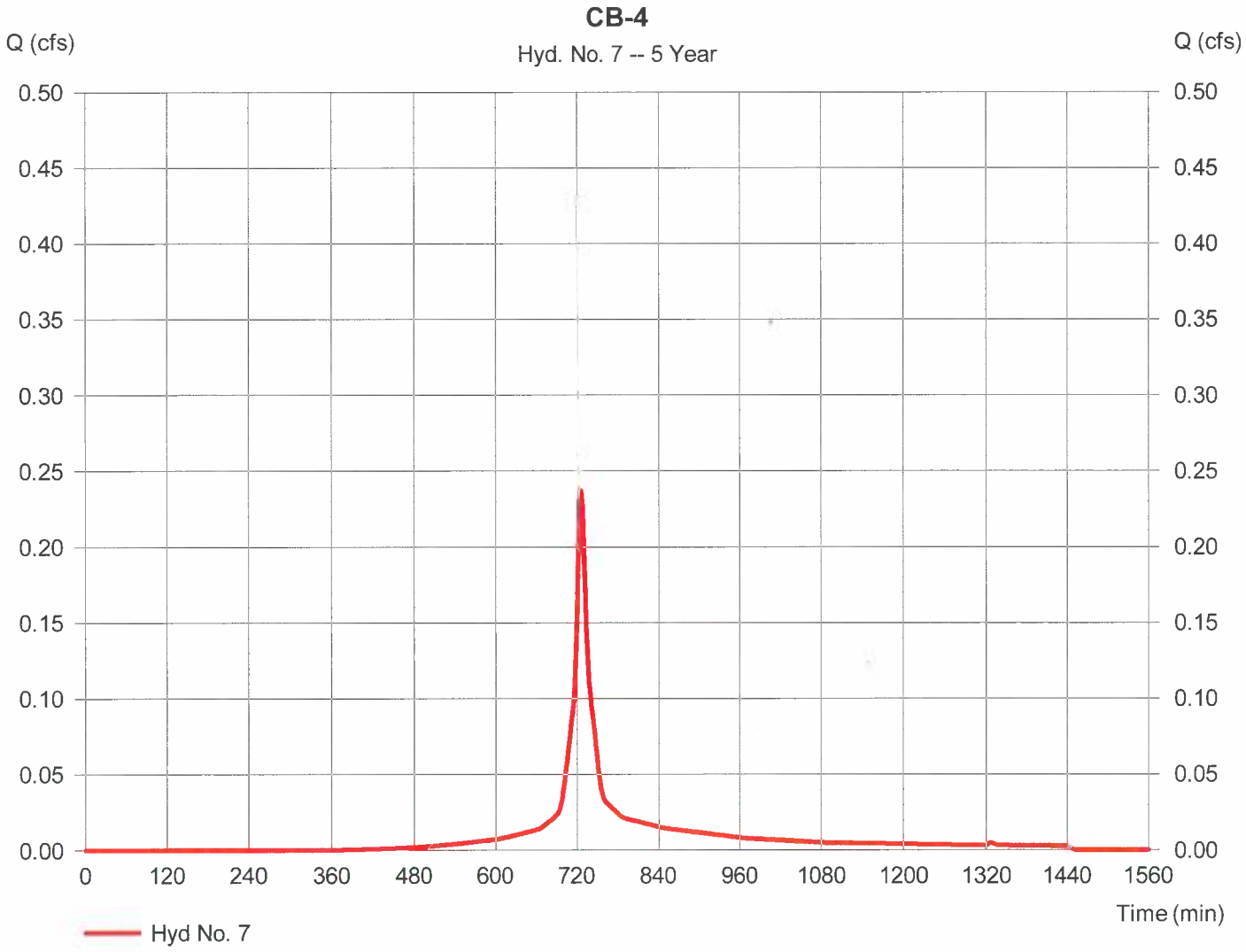
Hydrograph Report

Hyd. No. 7

CB-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.237 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 819 cuft
Drainage area	= 0.080 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 71) + (0.050 x 98)] / 0.080



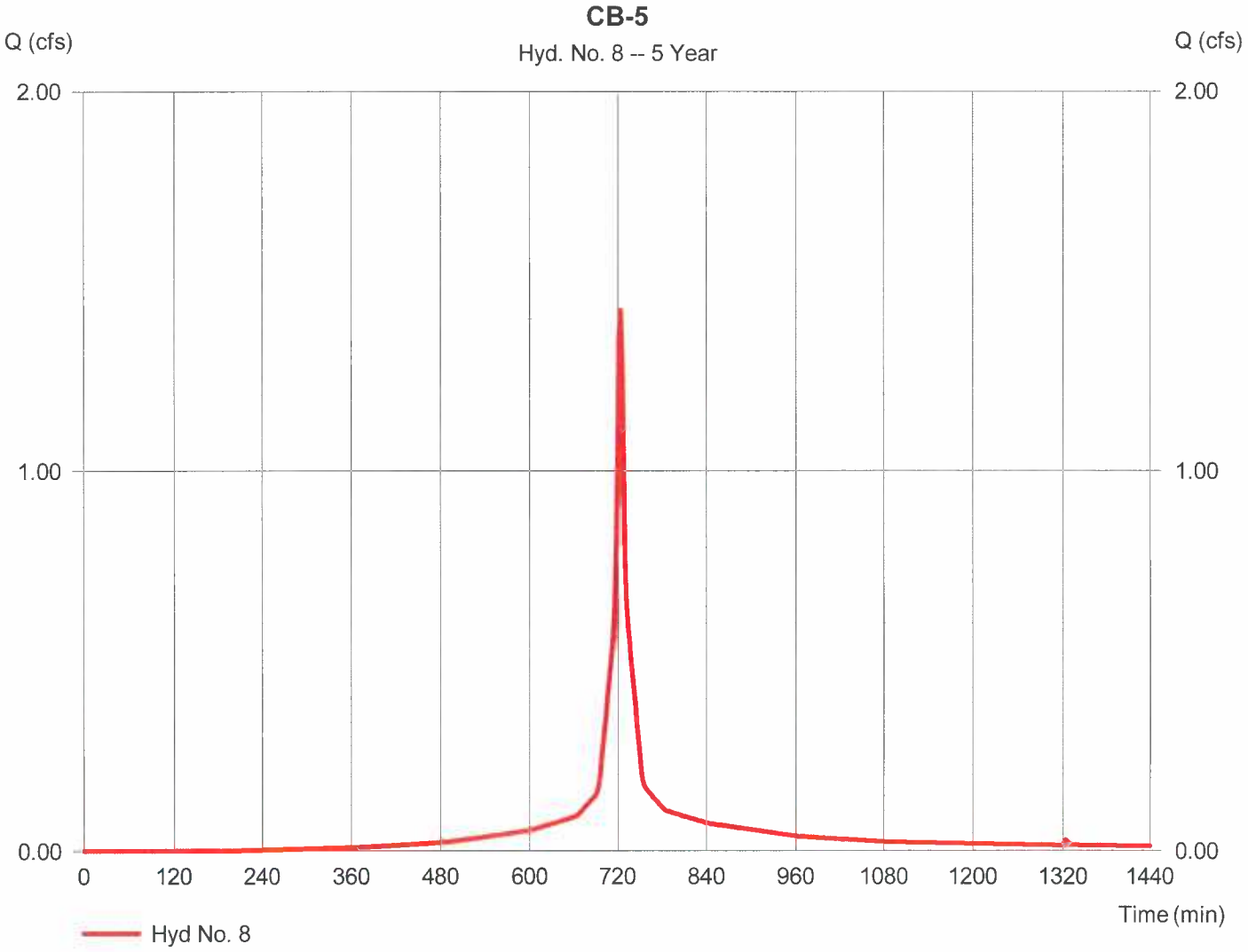
Hydrograph Report

Hyd. No. 8

CB-5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.423 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,542 cuft
Drainage area	= 0.390 ac	Curve number	= 94*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.050 x 74) + (0.010 x 71) + (0.330 x 98)] / 0.390



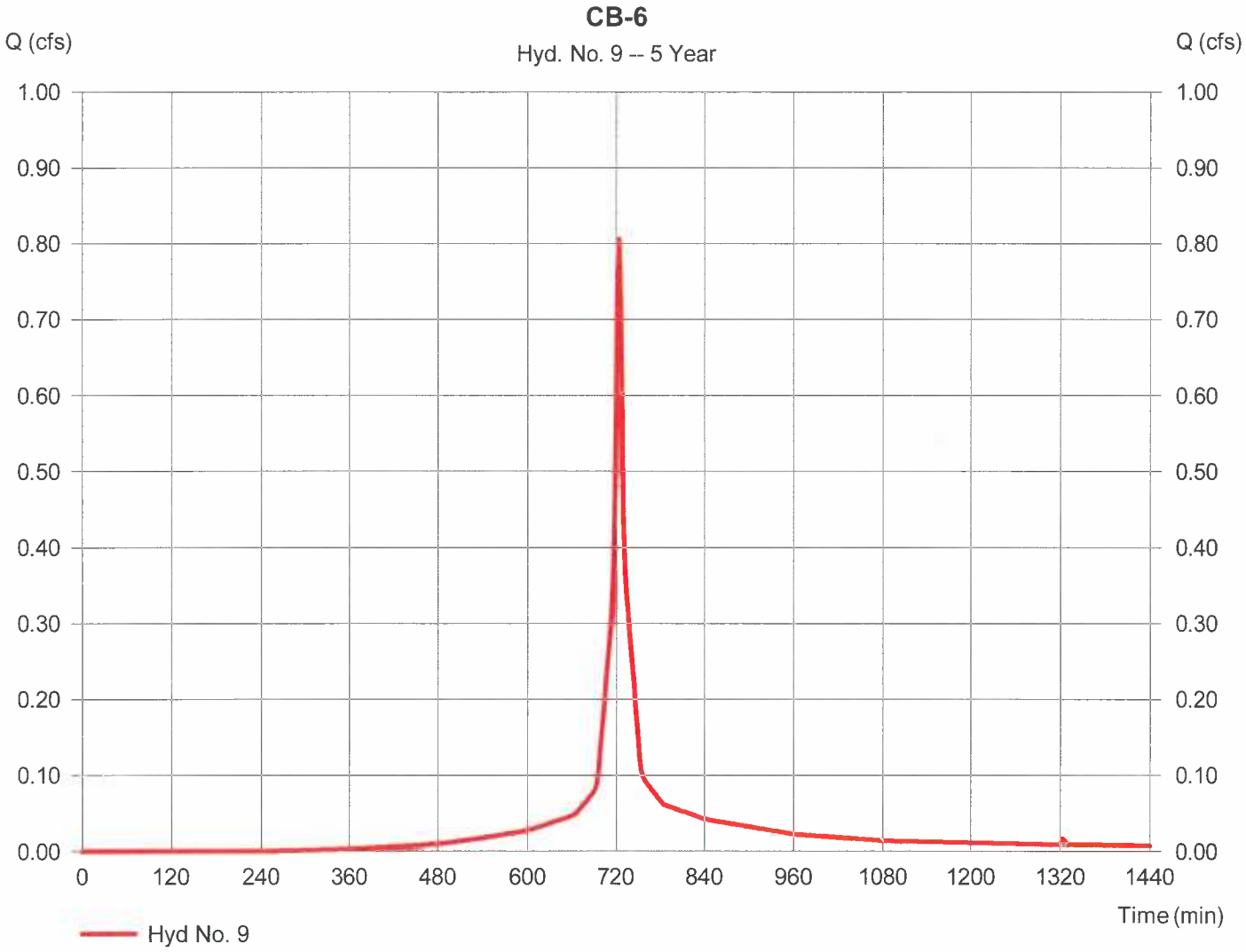
Hydrograph Report

Hyd. No. 9

CB-6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.805 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,516 cuft
Drainage area	= 0.230 ac	Curve number	= 92*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.050 x 71) + (0.180 x 98)] / 0.230



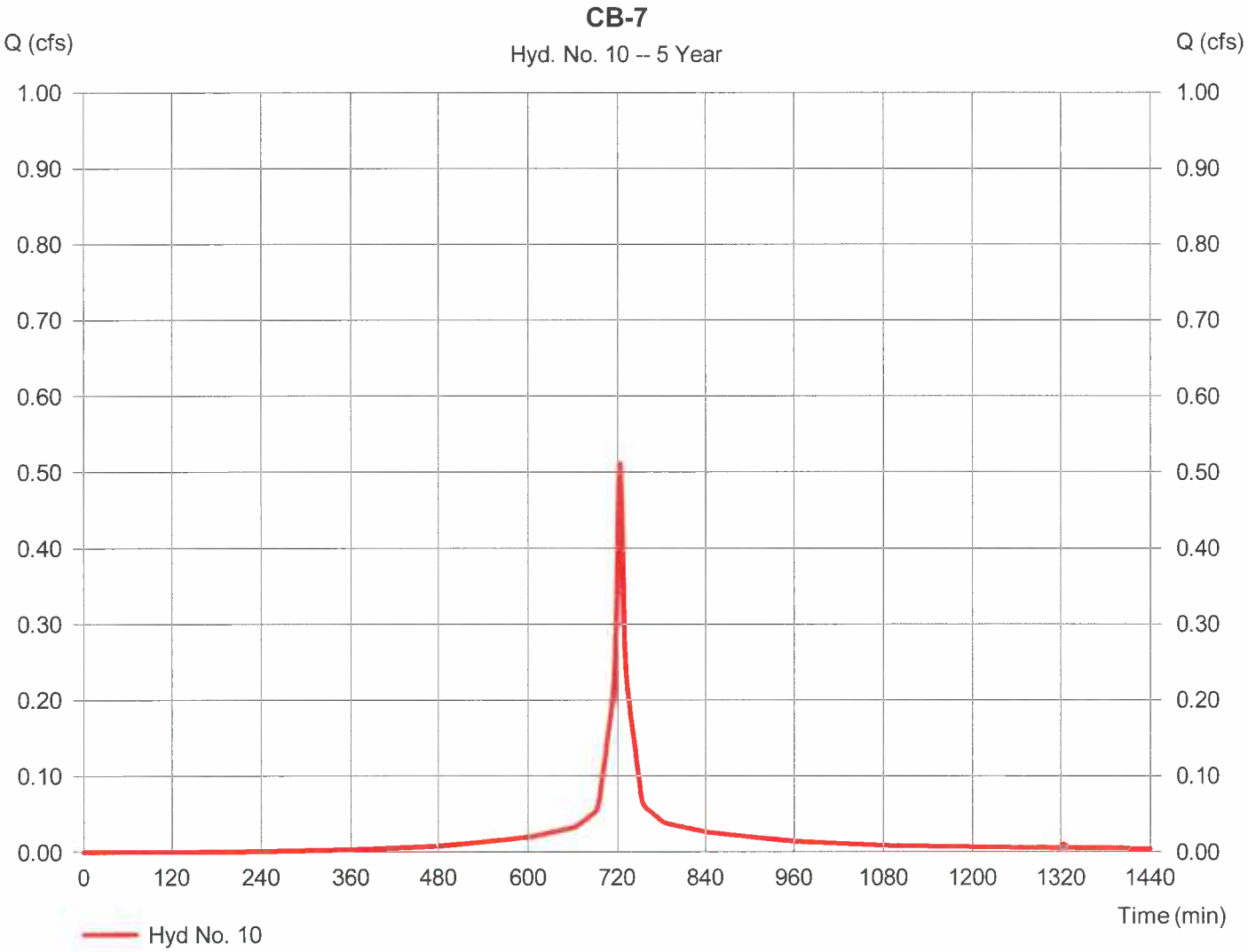
Hydrograph Report

Hyd. No. 10

CB-7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.511 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,631 cuft
Drainage area	= 0.140 ac	Curve number	= 94*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 71) + (0.120 x 98)] / 0.140



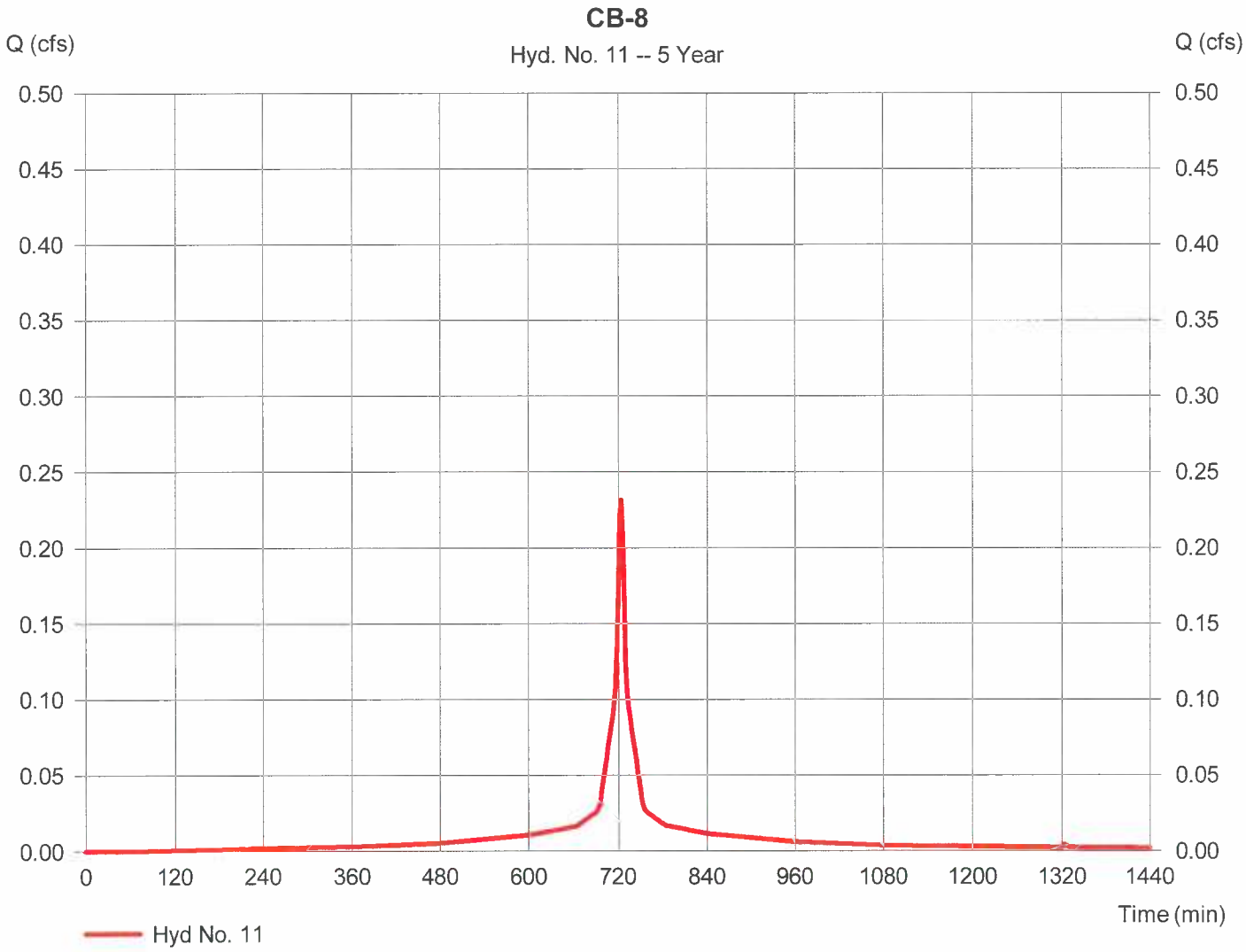
Hydrograph Report

Hyd. No. 11

CB-8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.231 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 789 cuft
Drainage area	= 0.060 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = + (0.060 x 98)] / 0.060



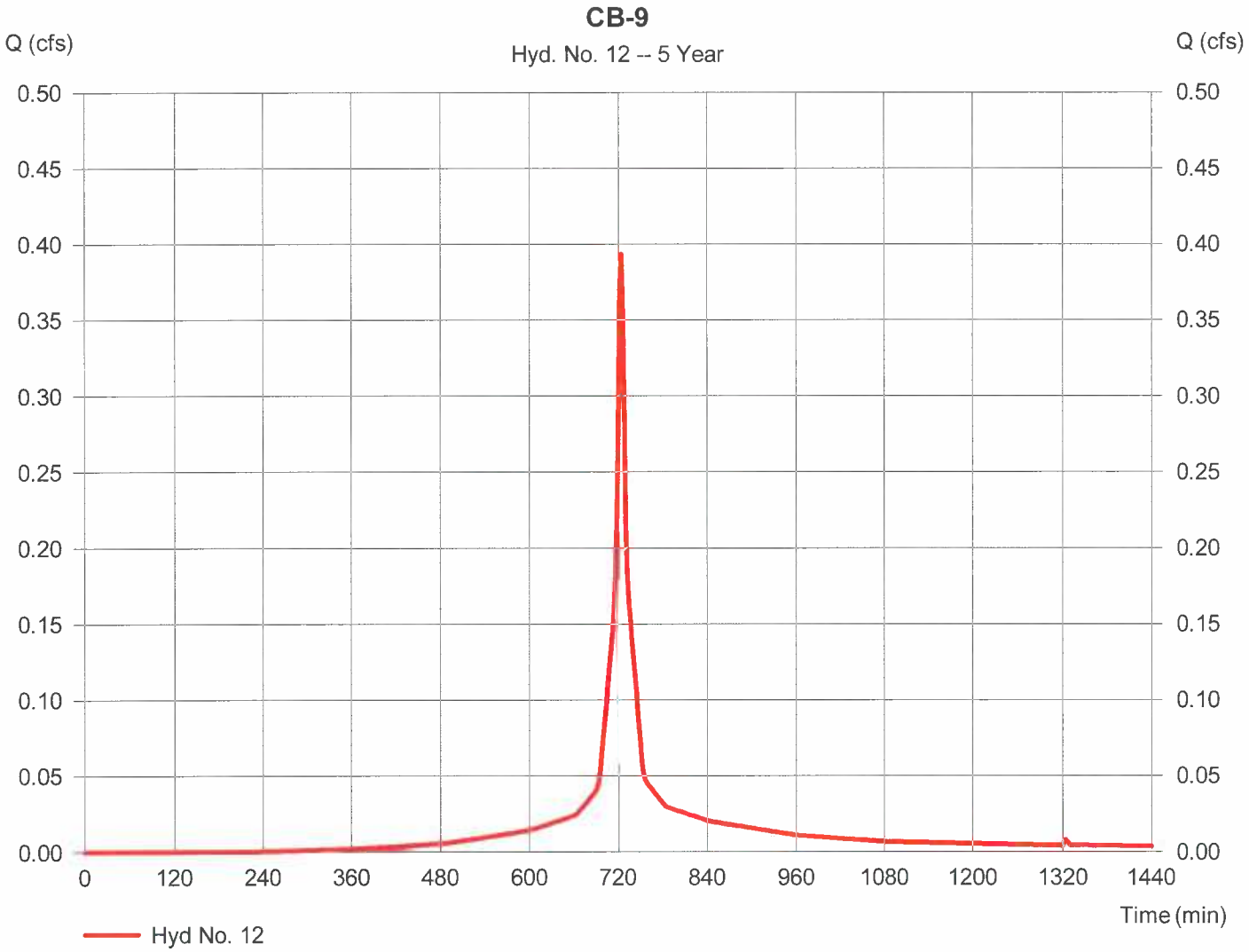
Hydrograph Report

Hyd. No. 12

CB-9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.394 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,242 cuft
Drainage area	= 0.110 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 71) + (0.090 x 98)] / 0.110



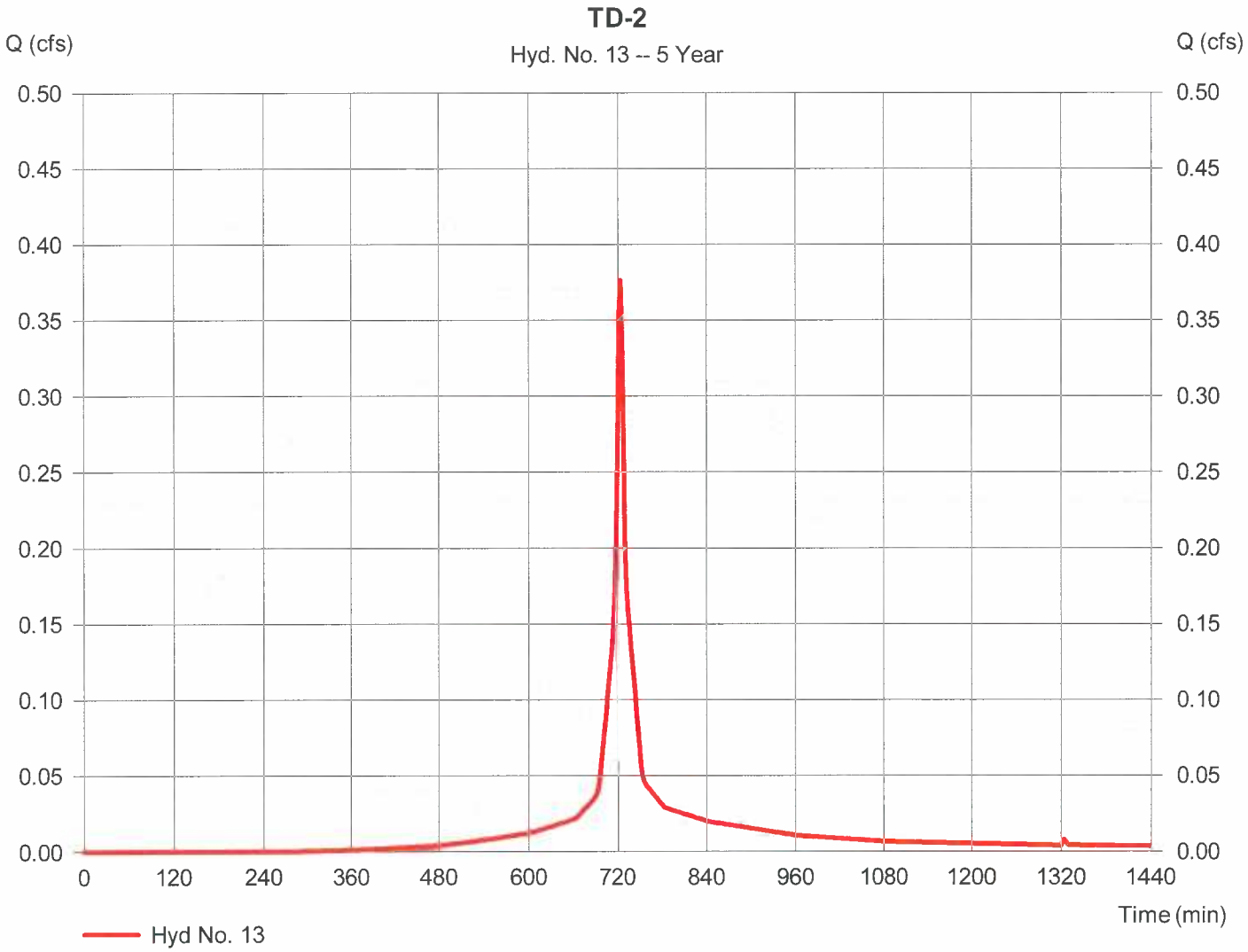
Hydrograph Report

Hyd. No. 13

TD-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.376 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,165 cuft
Drainage area	= 0.110 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 71) + (0.080 x 98)] / 0.110



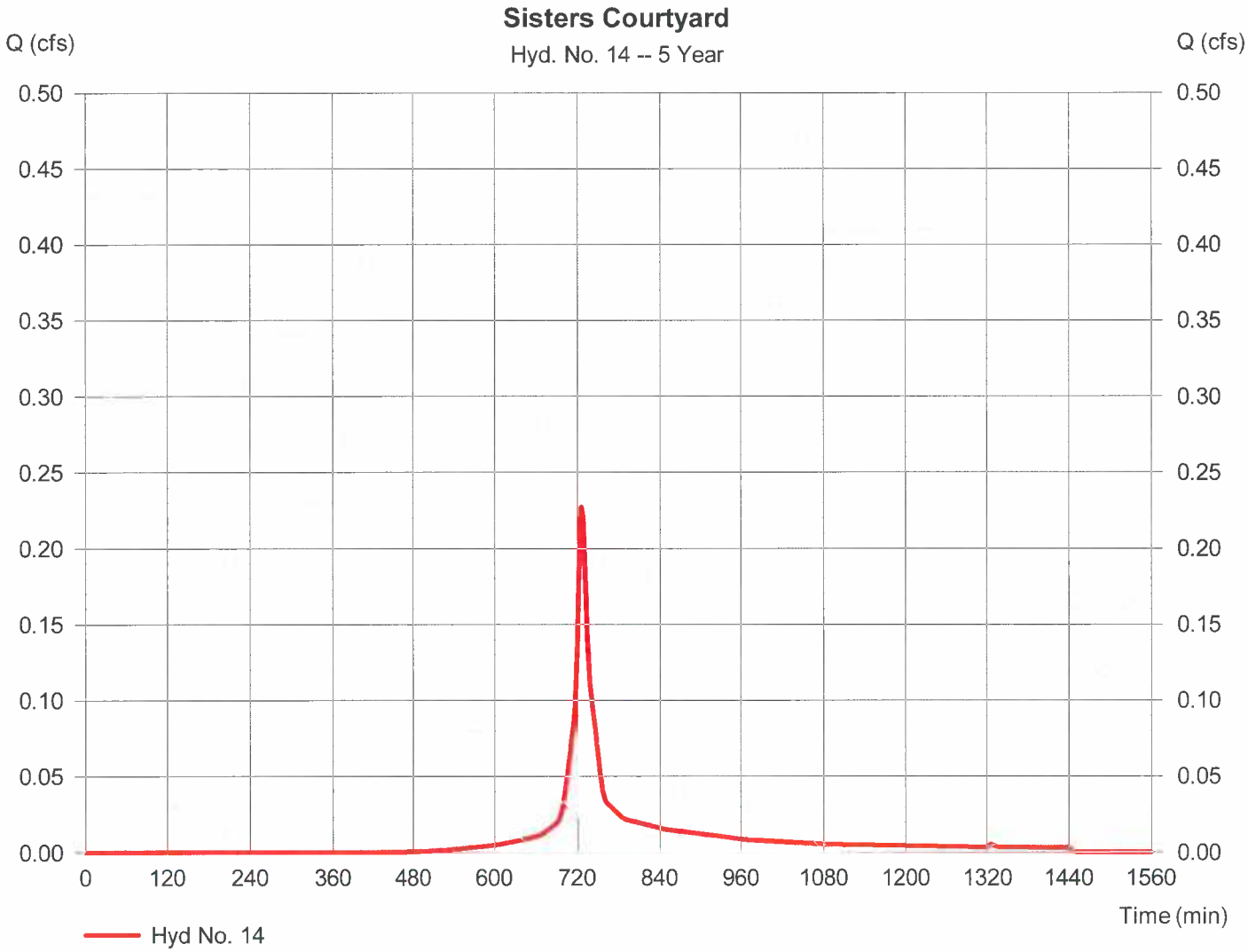
Hydrograph Report

Hyd. No. 14

Sisters Courtyard

Hydrograph type	= SCS Runoff	Peak discharge	= 0.227 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 775 cuft
Drainage area	= 0.090 ac	Curve number	= 83*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.050 x 71) + (0.040 x 98)] / 0.090



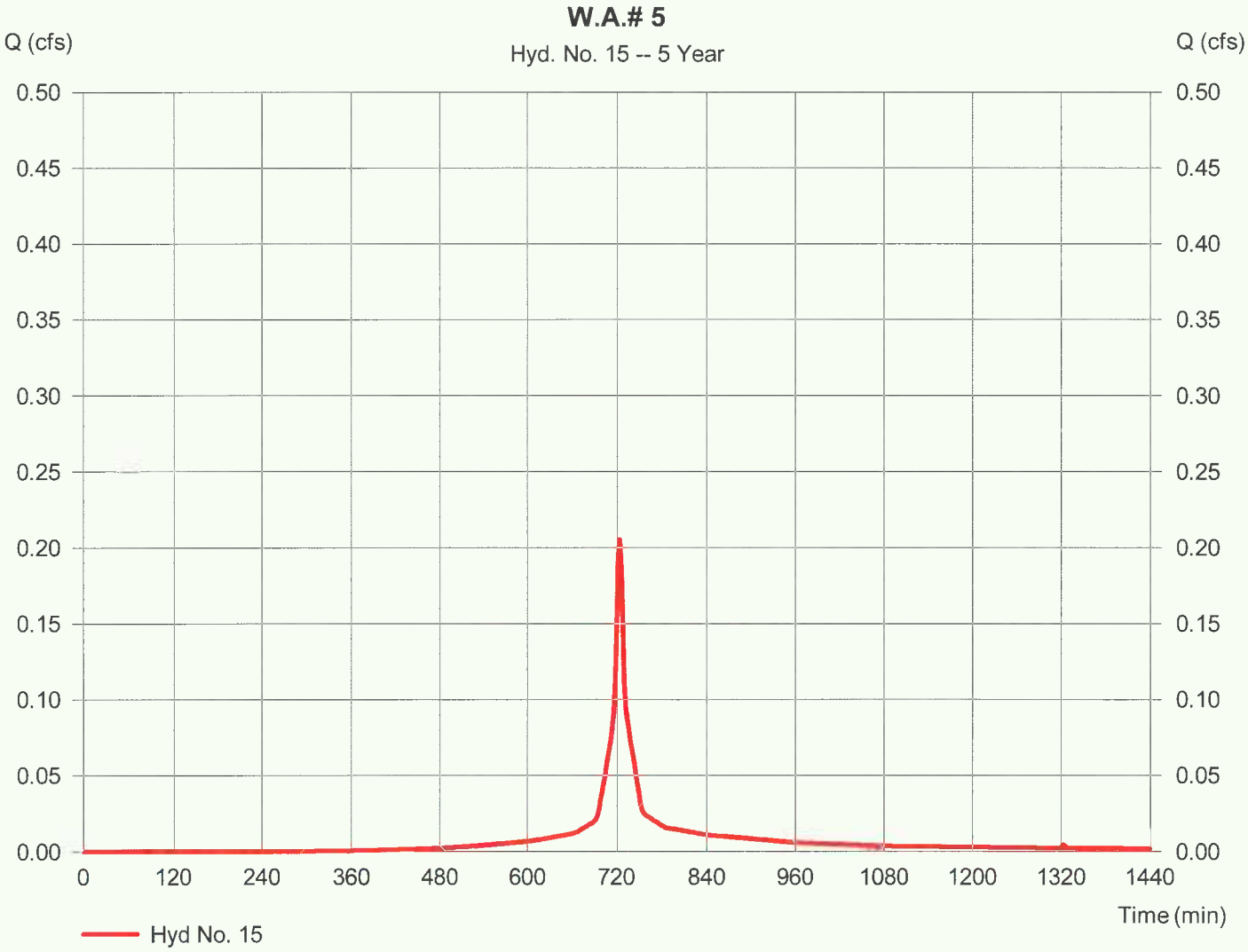
Hydrograph Report

Hyd. No. 15

W.A.# 5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.205 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 636 cuft
Drainage area	= 0.060 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 74) + (0.010 x 80) + (0.040 x 98)] / 0.060



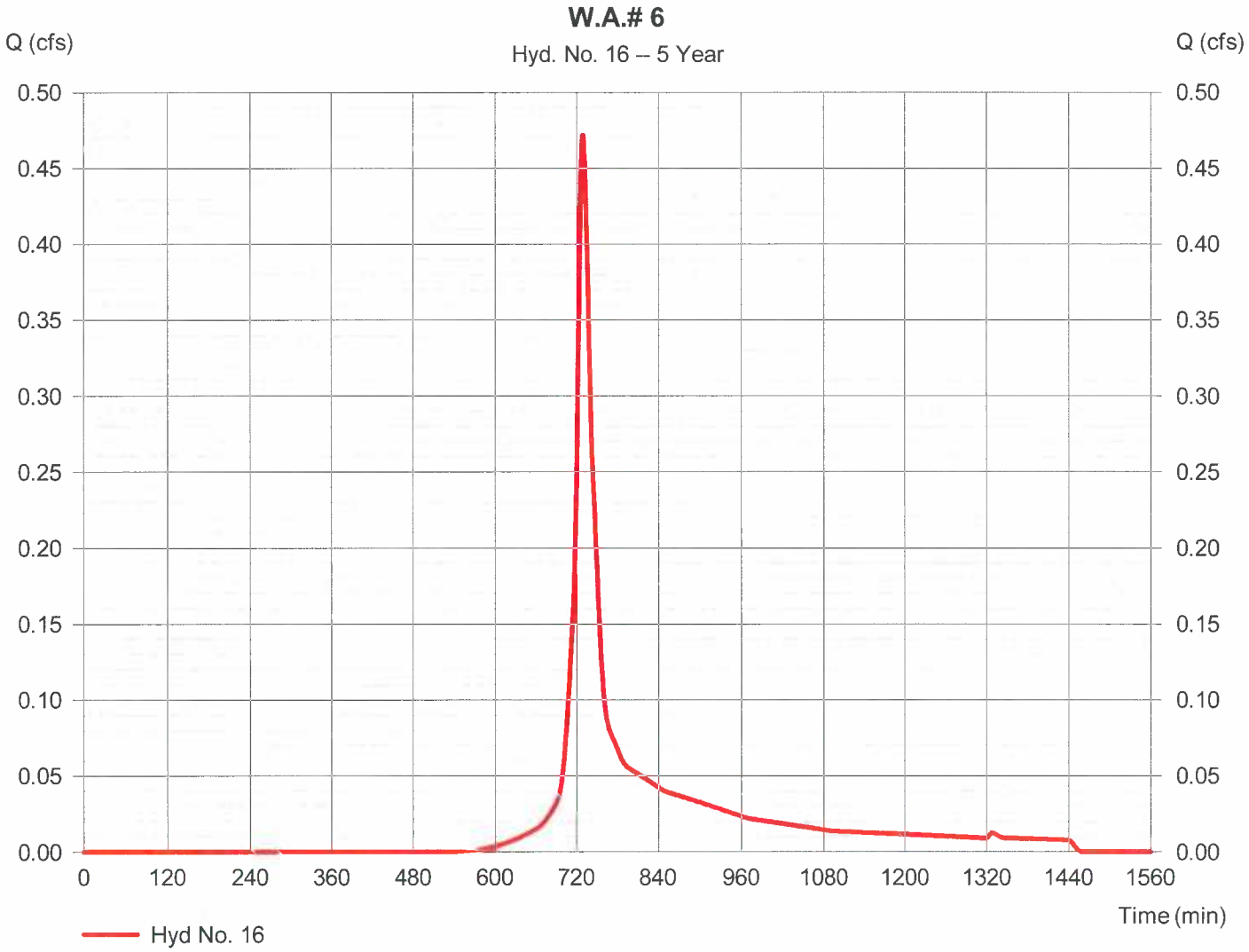
Hydrograph Report

Hyd. No. 16

W.A.# 6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.472 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,835 cuft
Drainage area	= 0.270 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.150 x 71) + (0.110 x 80) + (0.010 x 98)] / 0.270



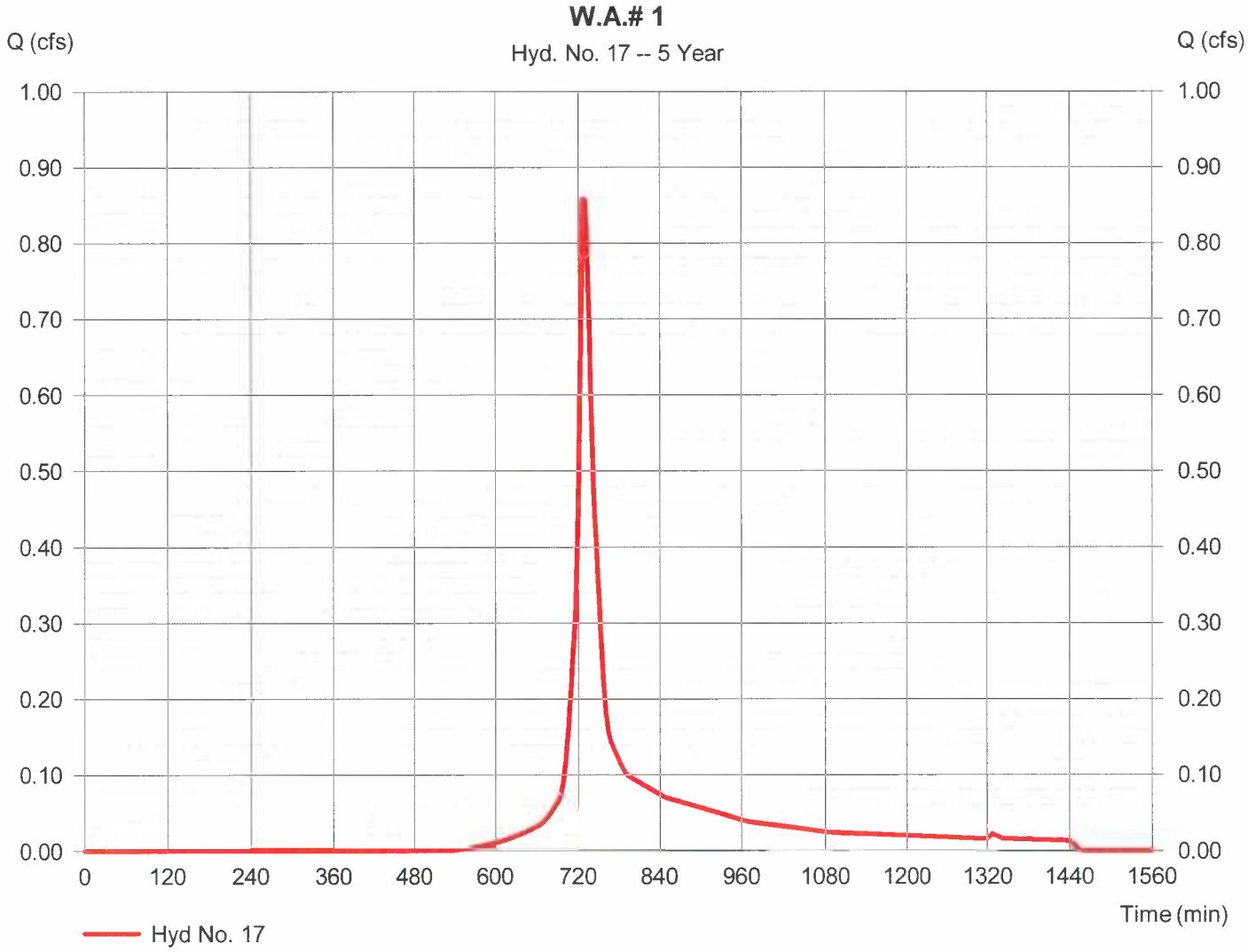
Hydrograph Report

Hyd. No. 17

W.A.# 1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.858 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 3,313 cuft
Drainage area	= 0.450 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.340 x 71) + (0.110 x 98)] / 0.450



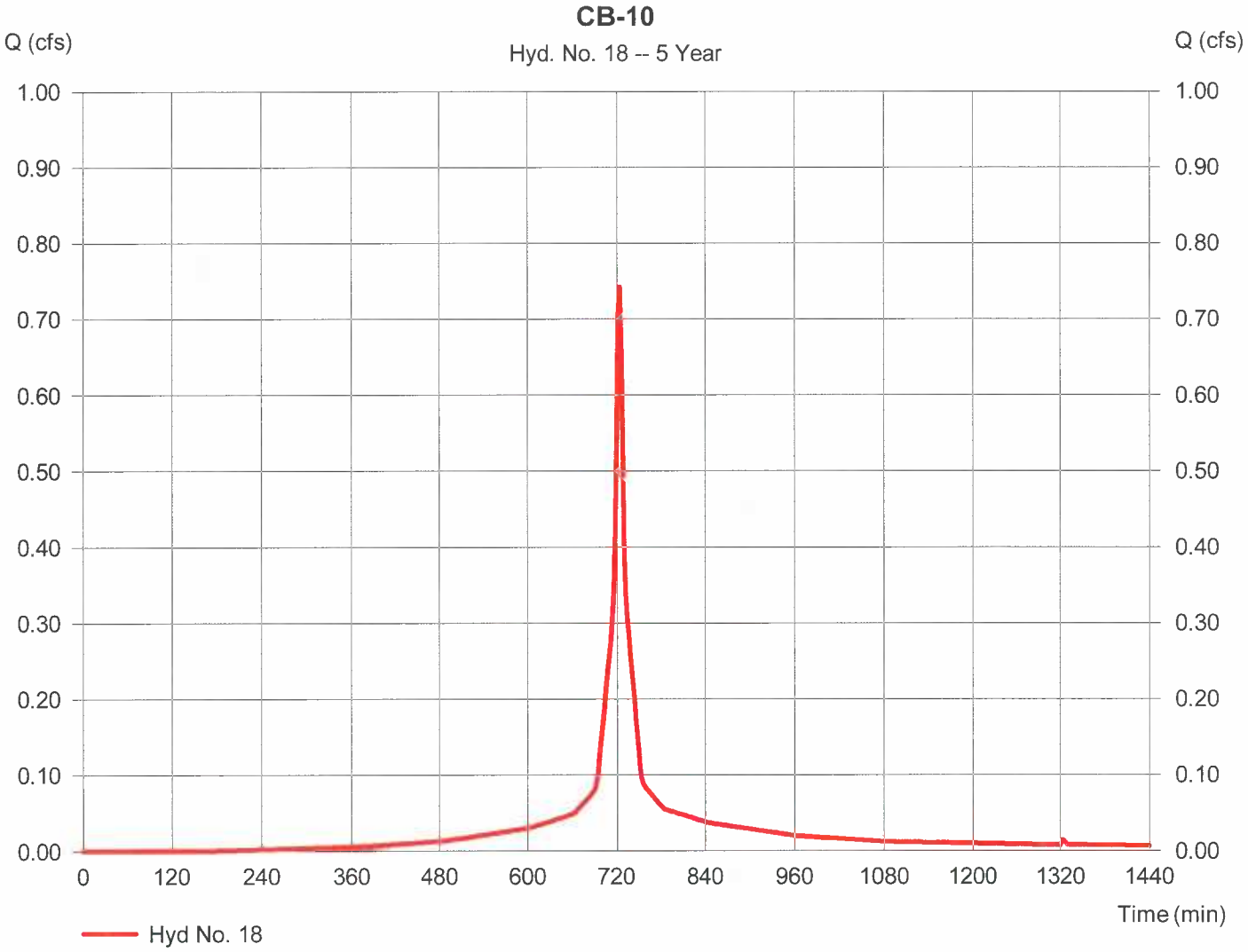
Hydrograph Report

Hyd. No. 18

CB-10

Hydrograph type	= SCS Runoff	Peak discharge	= 0.743 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,402 cuft
Drainage area	= 0.200 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.020 x 71) + (0.180 x 98)] / 0.200



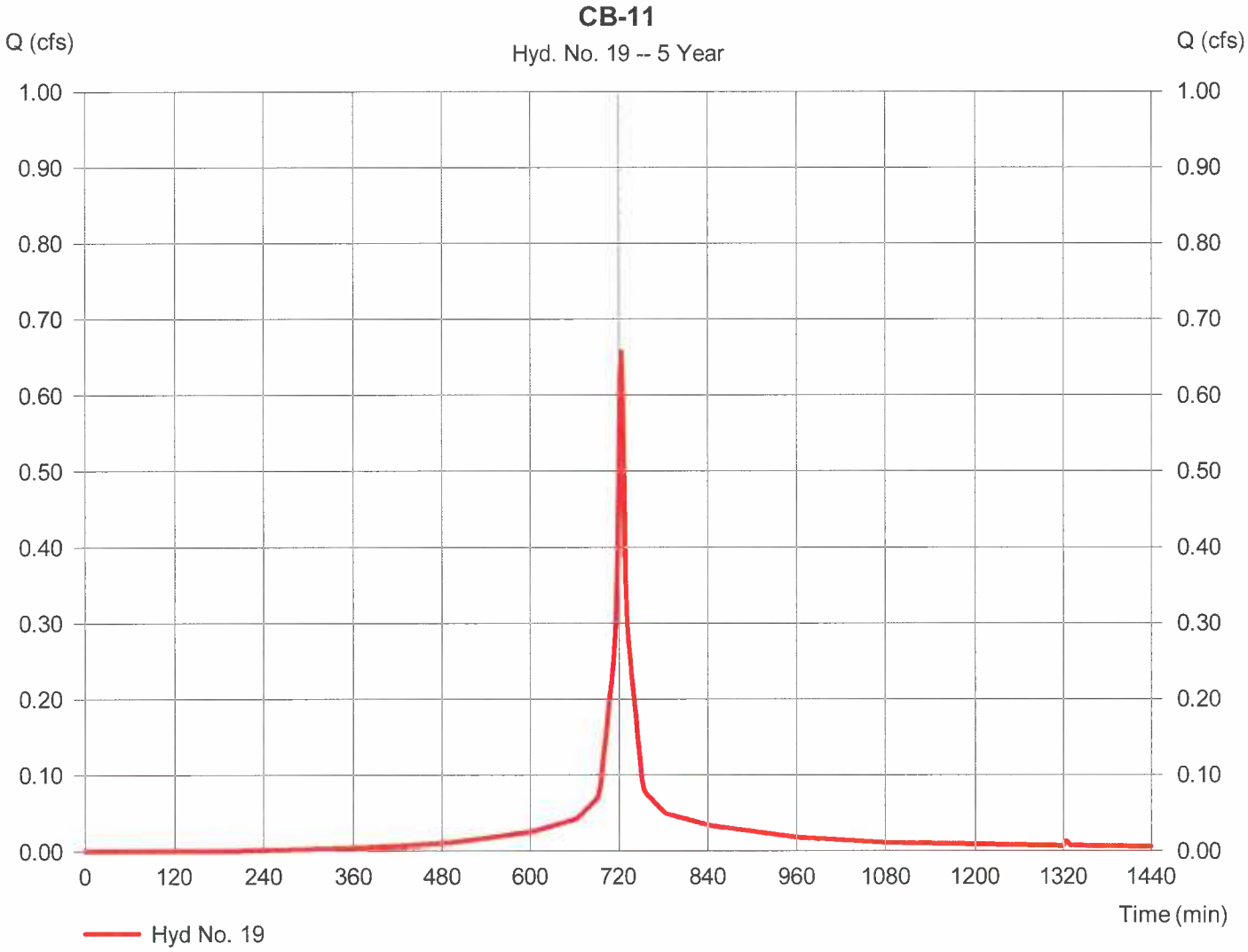
Hydrograph Report

Hyd. No. 19

CB-11

Hydrograph type	= SCS Runoff	Peak discharge	= 0.657 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,096 cuft
Drainage area	= 0.180 ac	Curve number	= 94*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 71) + (0.150 x 98)] / 0.180



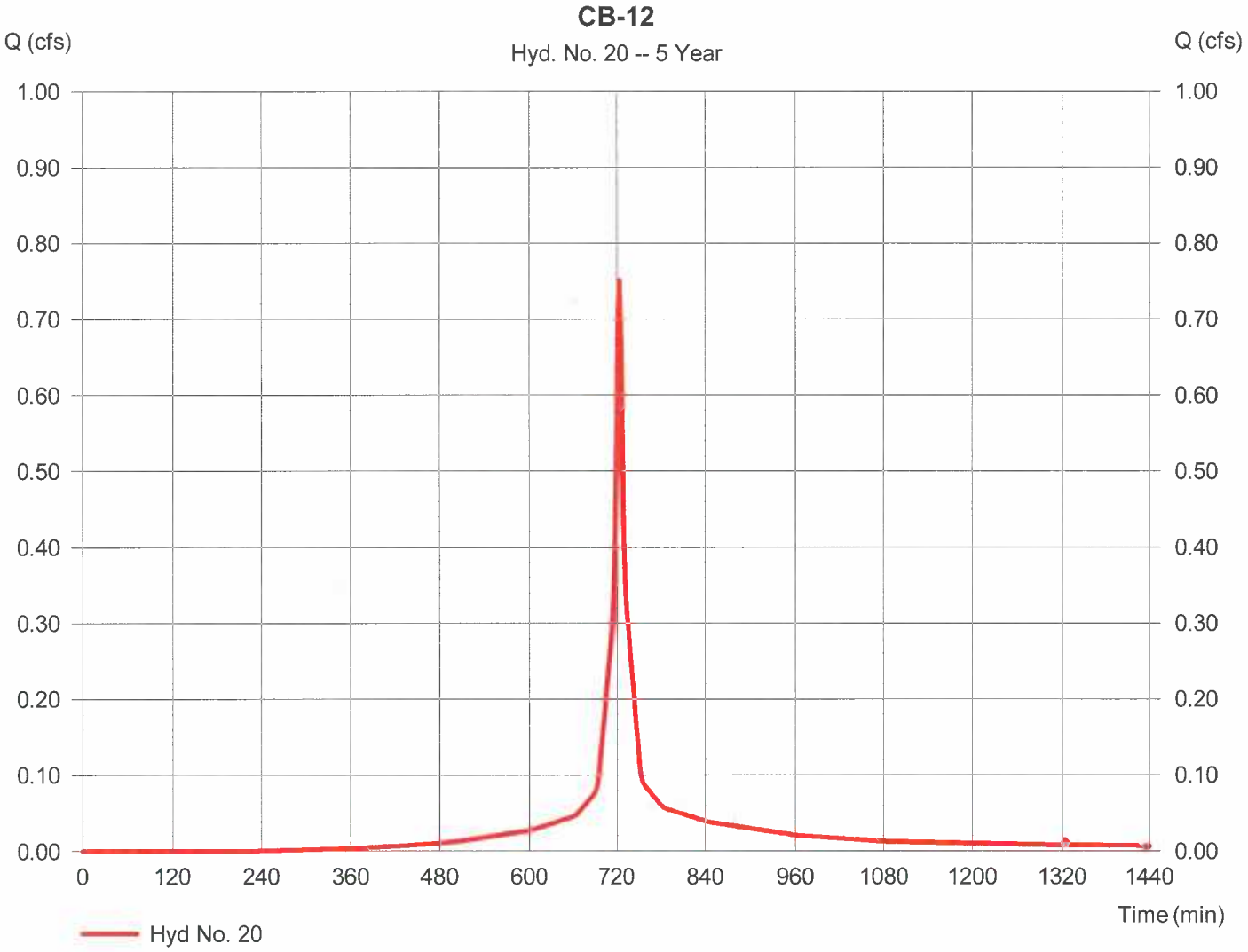
Hydrograph Report

Hyd. No. 20

CB-12

Hydrograph type	= SCS Runoff	Peak discharge	= 0.751 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,371 cuft
Drainage area	= 0.210 ac	Curve number	= 93*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 71) + (0.170 x 98)] / 0.210



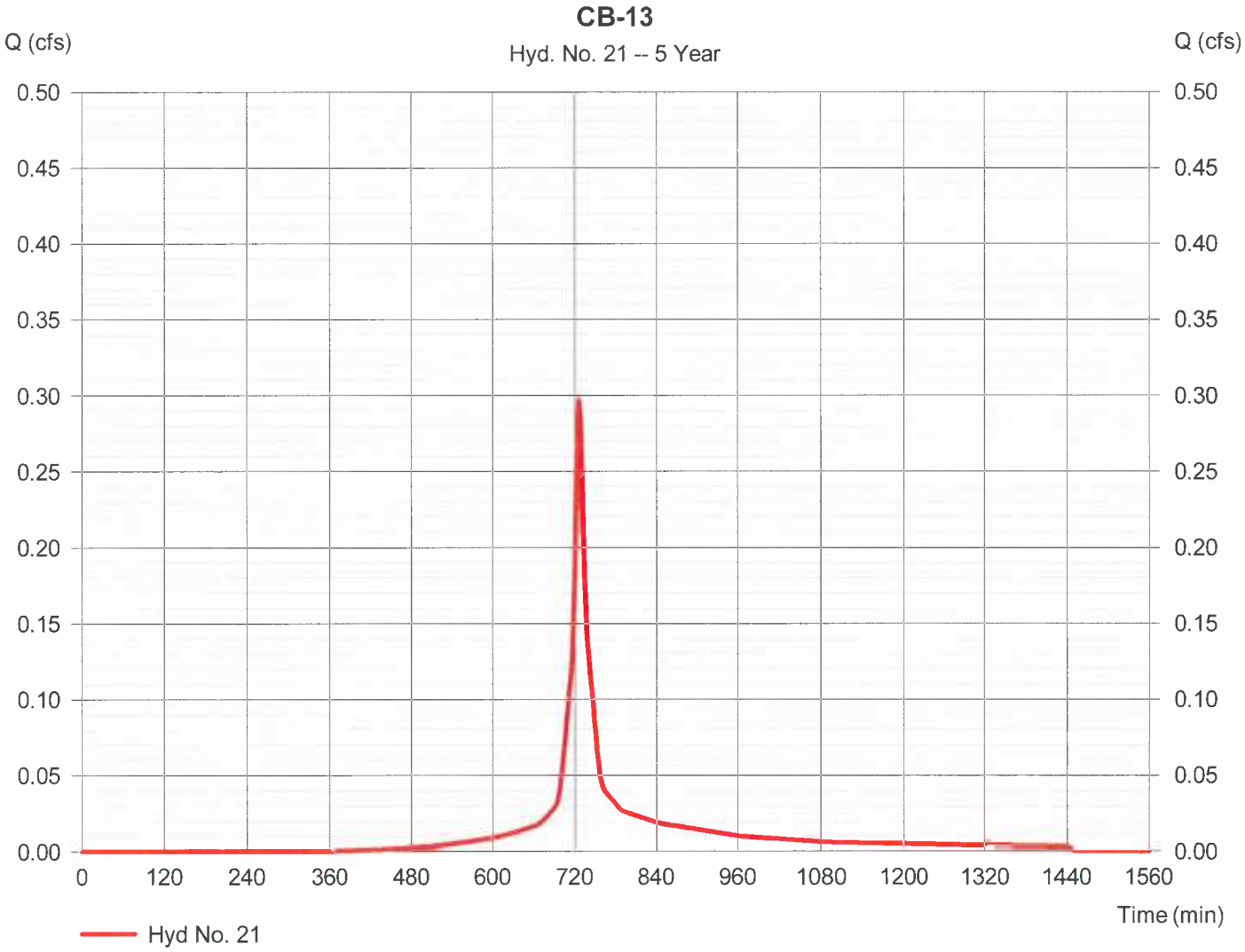
Hydrograph Report

Hyd. No. 21

CB-13

Hydrograph type	= SCS Runoff	Peak discharge	= 0.296 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 1,024 cuft
Drainage area	= 0.100 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 71) + (0.010 x 80) + (0.060 x 98)] / 0.100



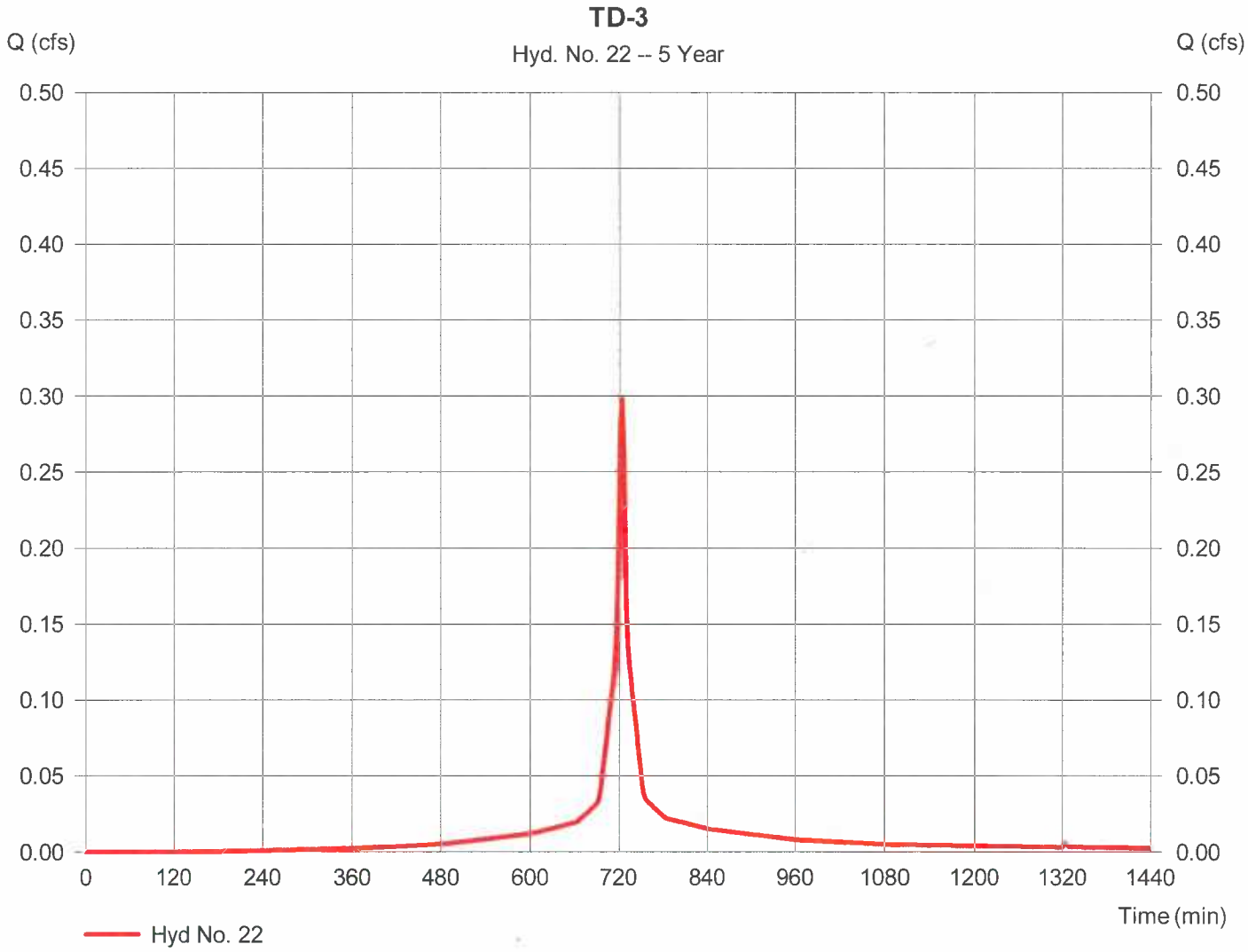
Hydrograph Report

Hyd. No. 22

TD-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.297 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 961 cuft
Drainage area	= 0.080 ac	Curve number	= 95*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 71) + (0.070 x 98)] / 0.080



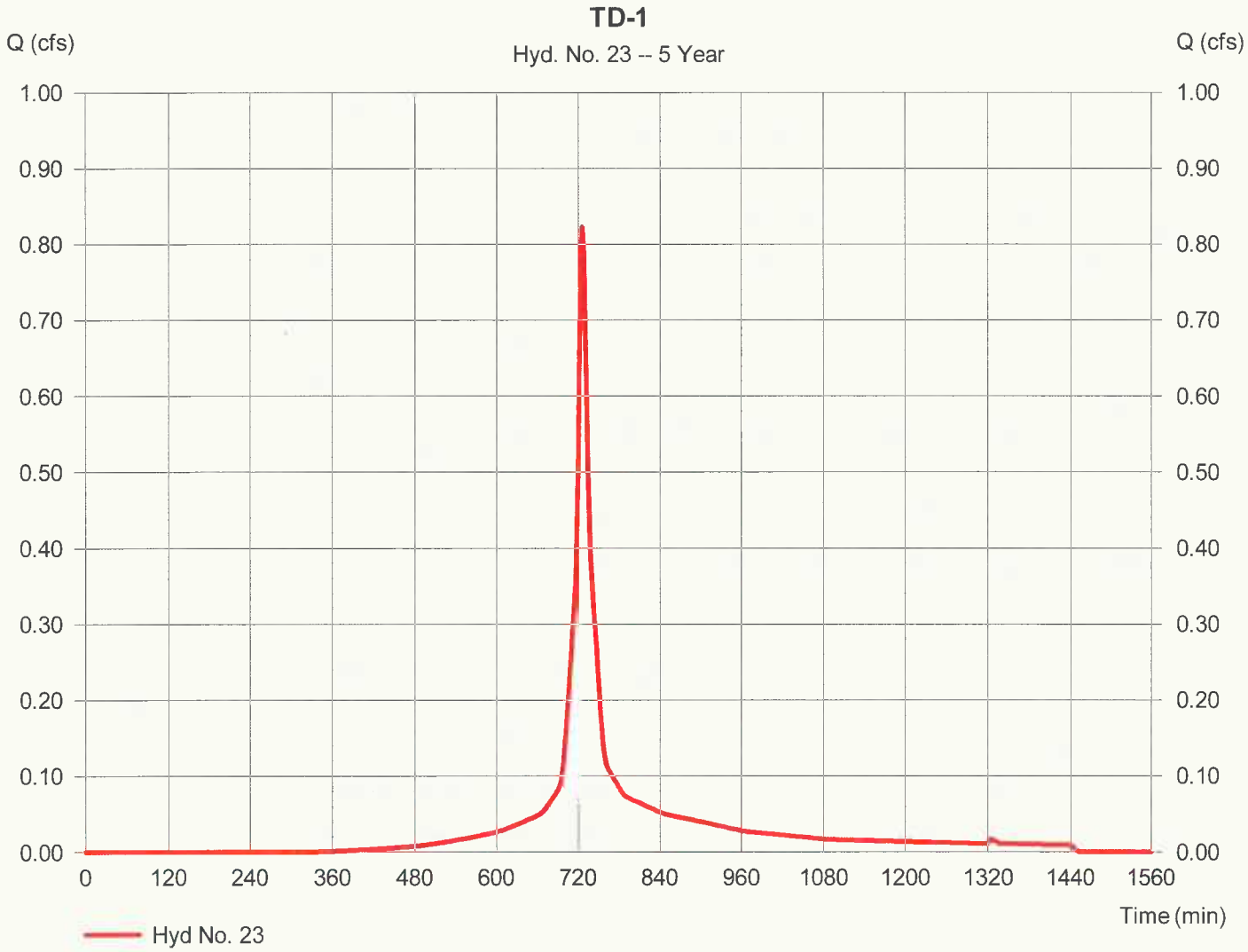
Hydrograph Report

Hyd. No. 23

TD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.823 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,859 cuft
Drainage area	= 0.270 ac	Curve number	= 89*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.060 x 71) + (0.040 x 80) + (0.170 x 98)] / 0.270



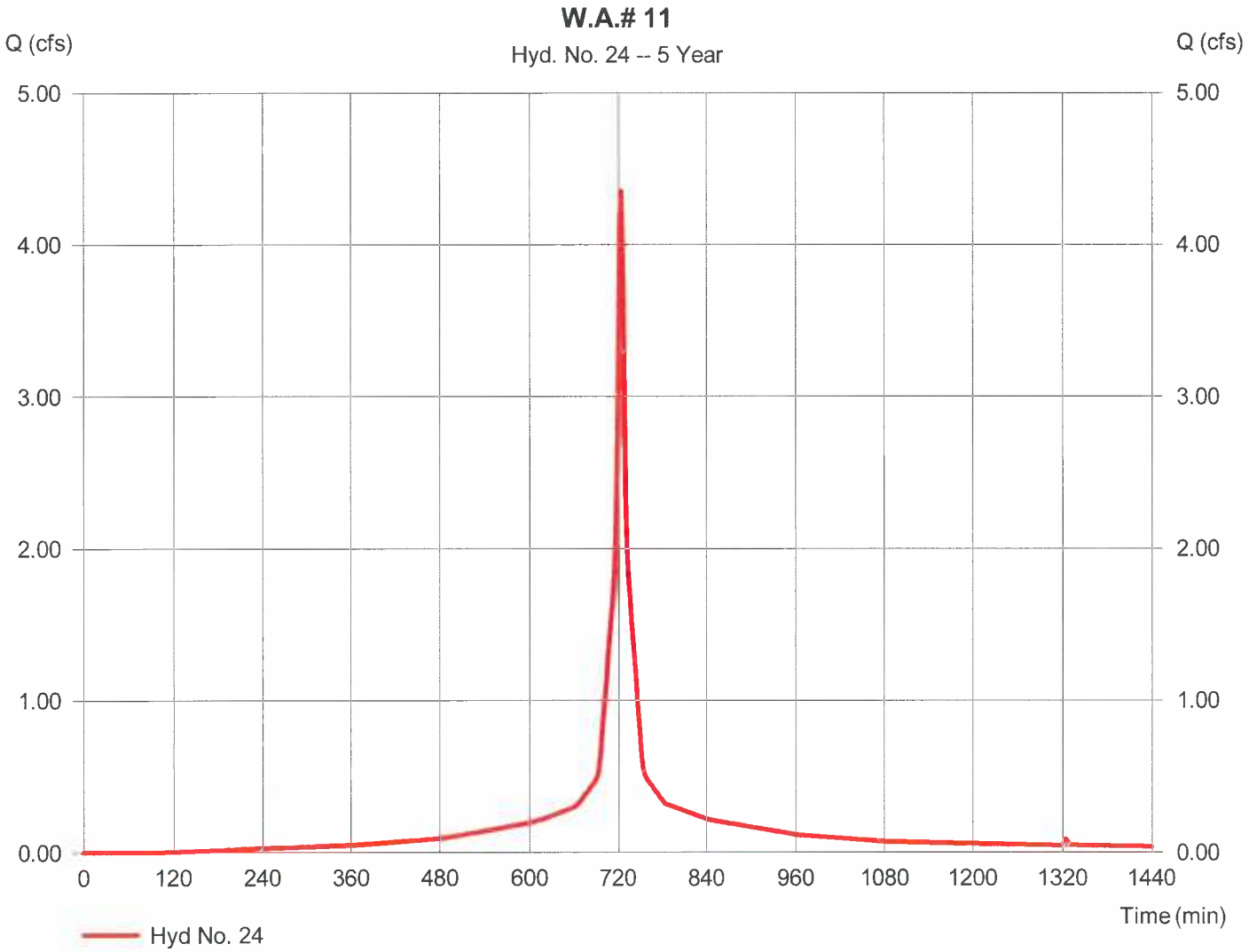
Hydrograph Report

Hyd. No. 24

W.A.# 11

Hydrograph type	= SCS Runoff	Peak discharge	= 4.353 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 14,552 cuft
Drainage area	= 1.140 ac	Curve number	= 97*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.040 x 71) + (1.100 x 98)] / 1.140



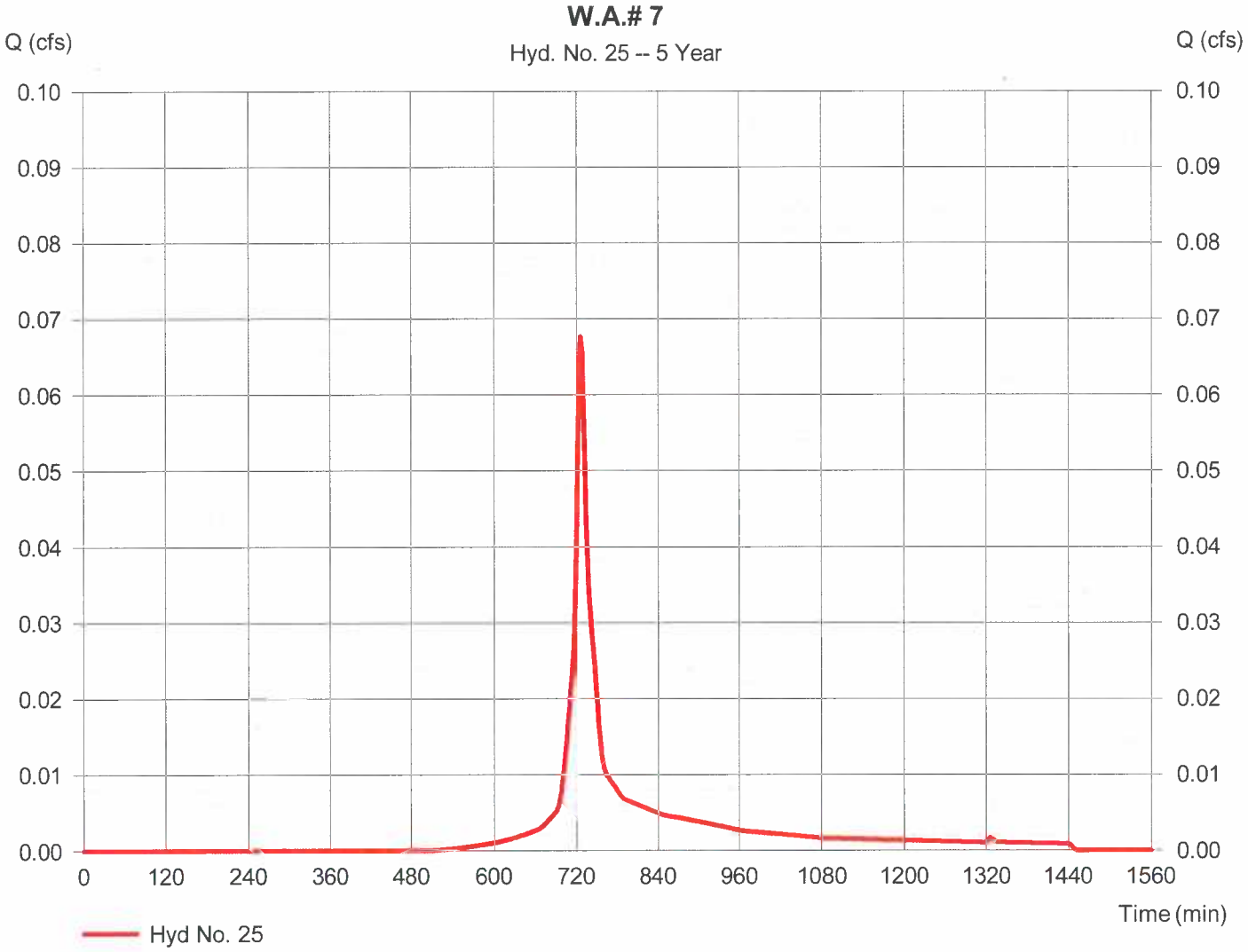
Hydrograph Report

Hyd. No. 25

W.A.# 7

Hydrograph type	= SCS Runoff	Peak discharge	= 0.068 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 231 cuft
Drainage area	= 0.030 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 80)] / 0.030



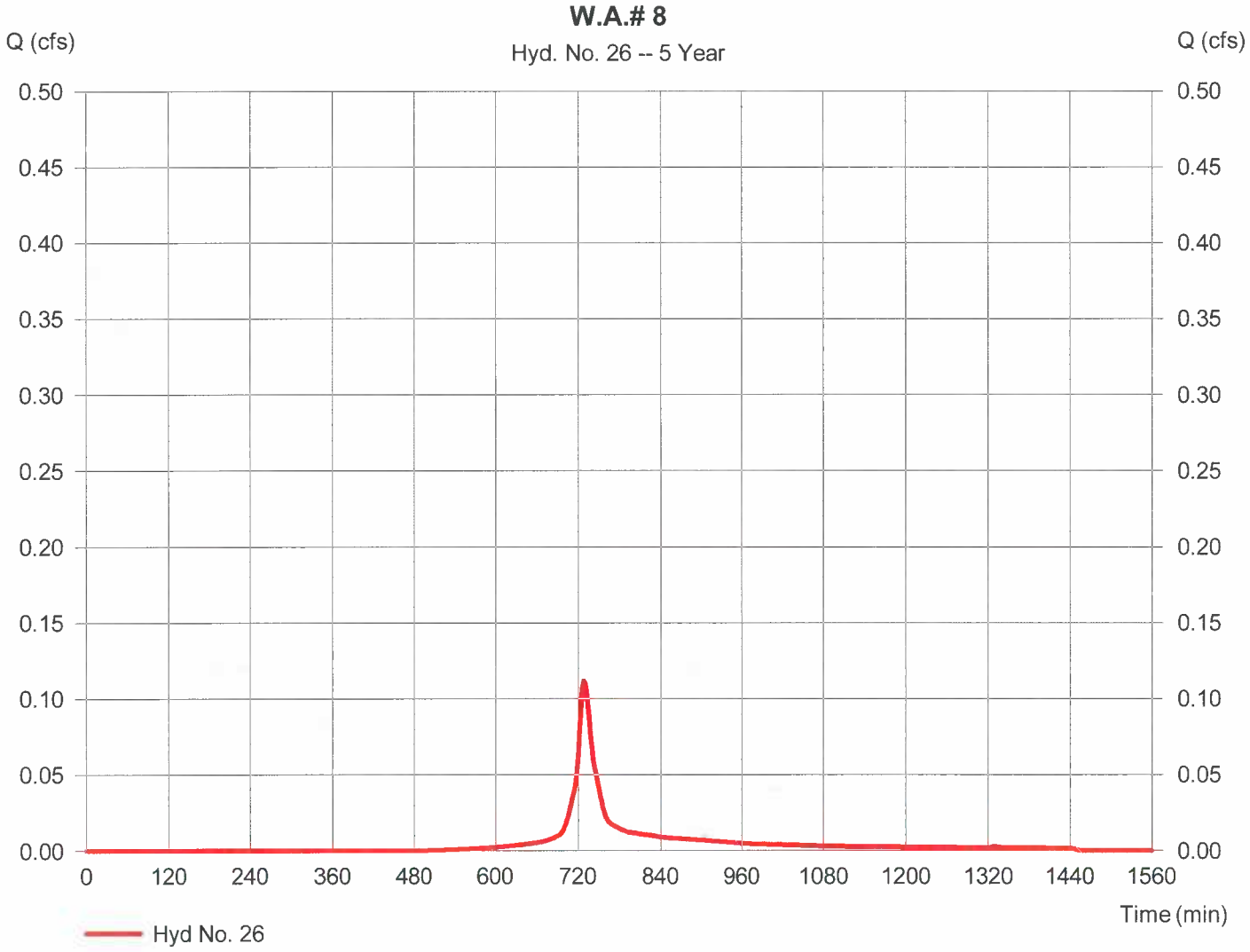
Hydrograph Report

Hyd. No. 26

W.A.# 8

Hydrograph type	= SCS Runoff	Peak discharge	= 0.112 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 428 cuft
Drainage area	= 0.050 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 71) + (0.030 x 80) + (0.010 x 98)] / 0.050



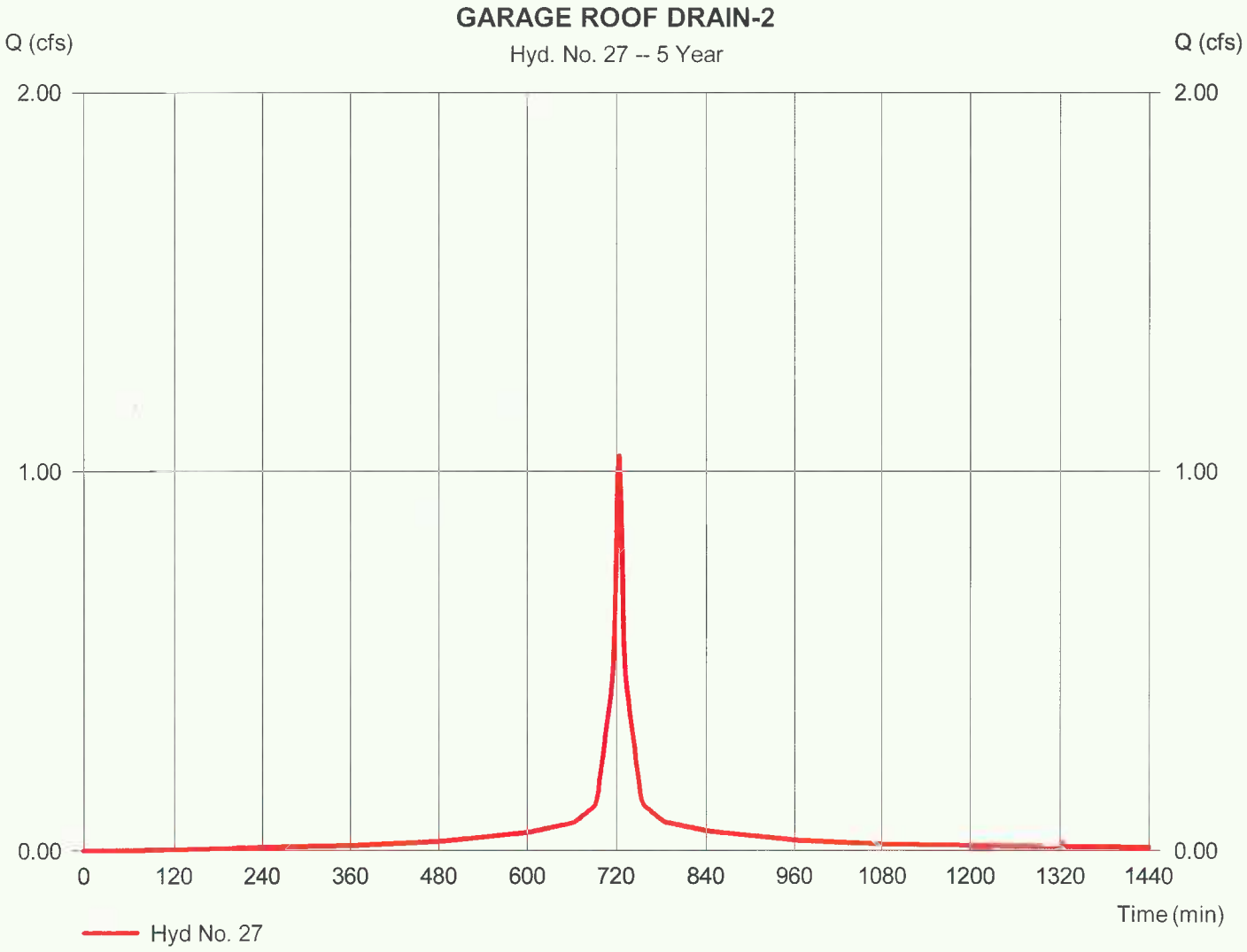
Hydrograph Report

Hyd. No. 27

GARAGE ROOF DRAIN-2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.041 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,551 cuft
Drainage area	= 0.270 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.390 x 98)] / 0.270

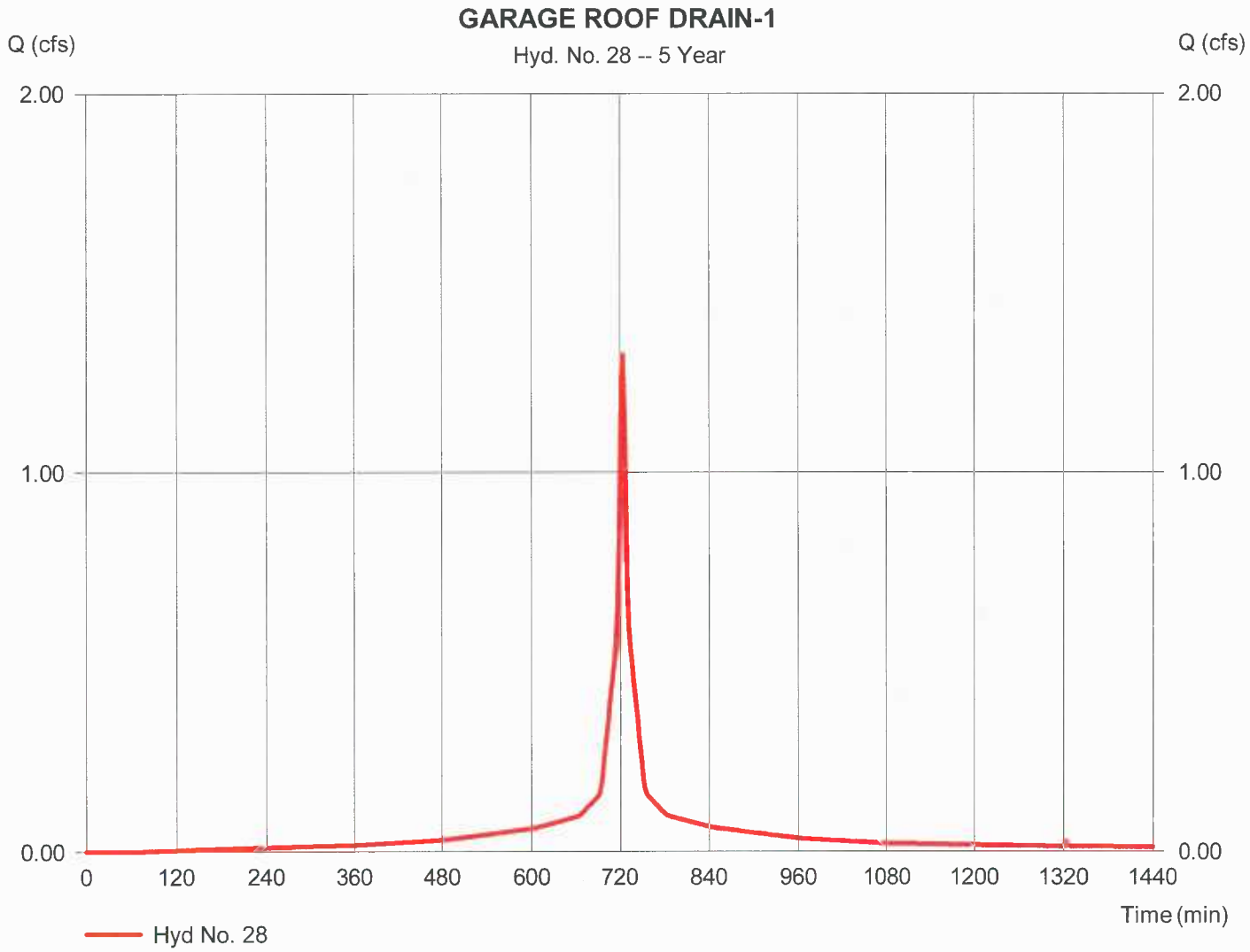


Hydrograph Report

Hyd. No. 28

GARAGE ROOF DRAIN-1

Hydrograph type	= SCS Runoff	Peak discharge	= 1.311 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,472 cuft
Drainage area	= 0.340 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

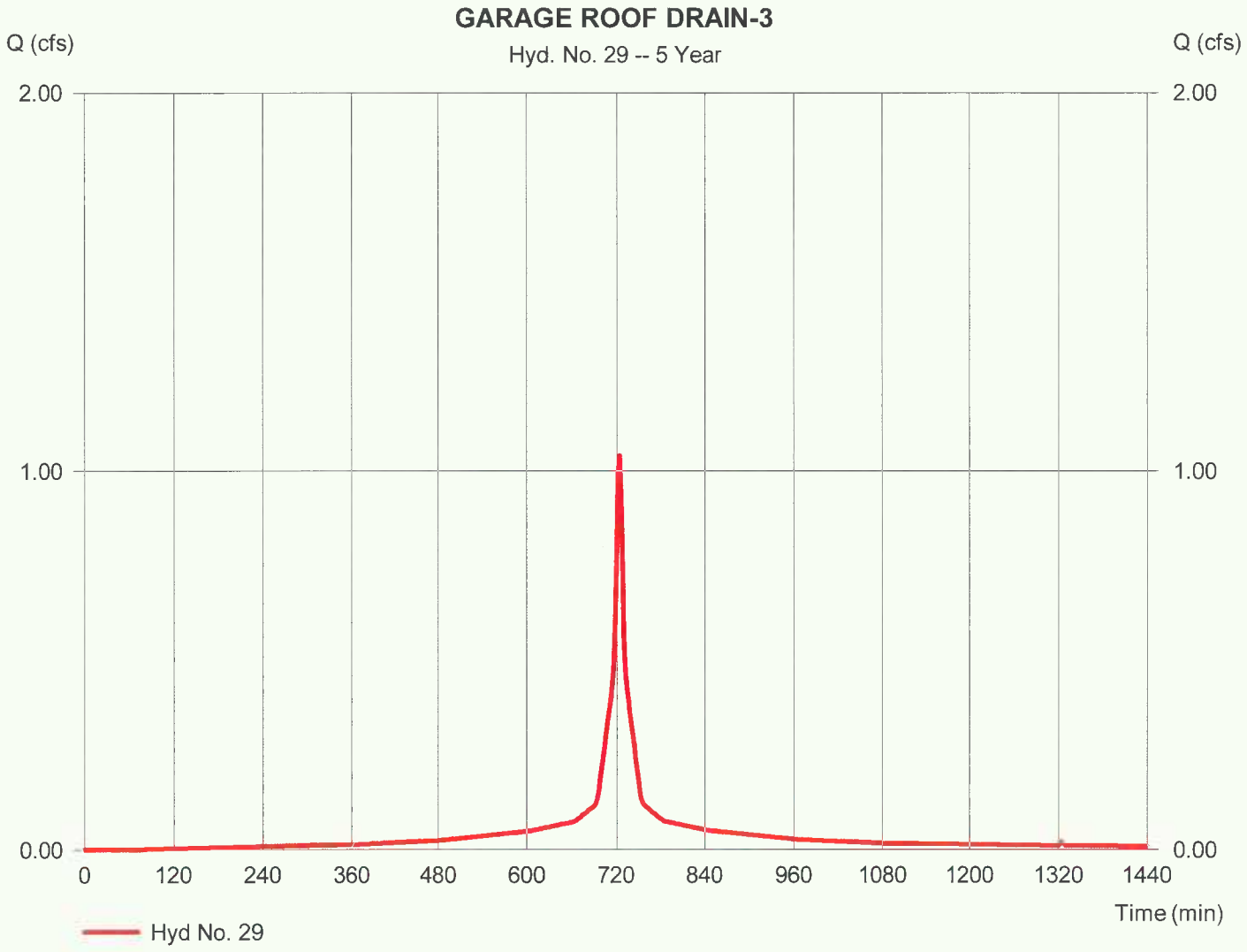


Hydrograph Report

Hyd. No. 29

GARAGE ROOF DRAIN-3

Hydrograph type	= SCS Runoff	Peak discharge	= 1.041 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,551 cuft
Drainage area	= 0.270 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

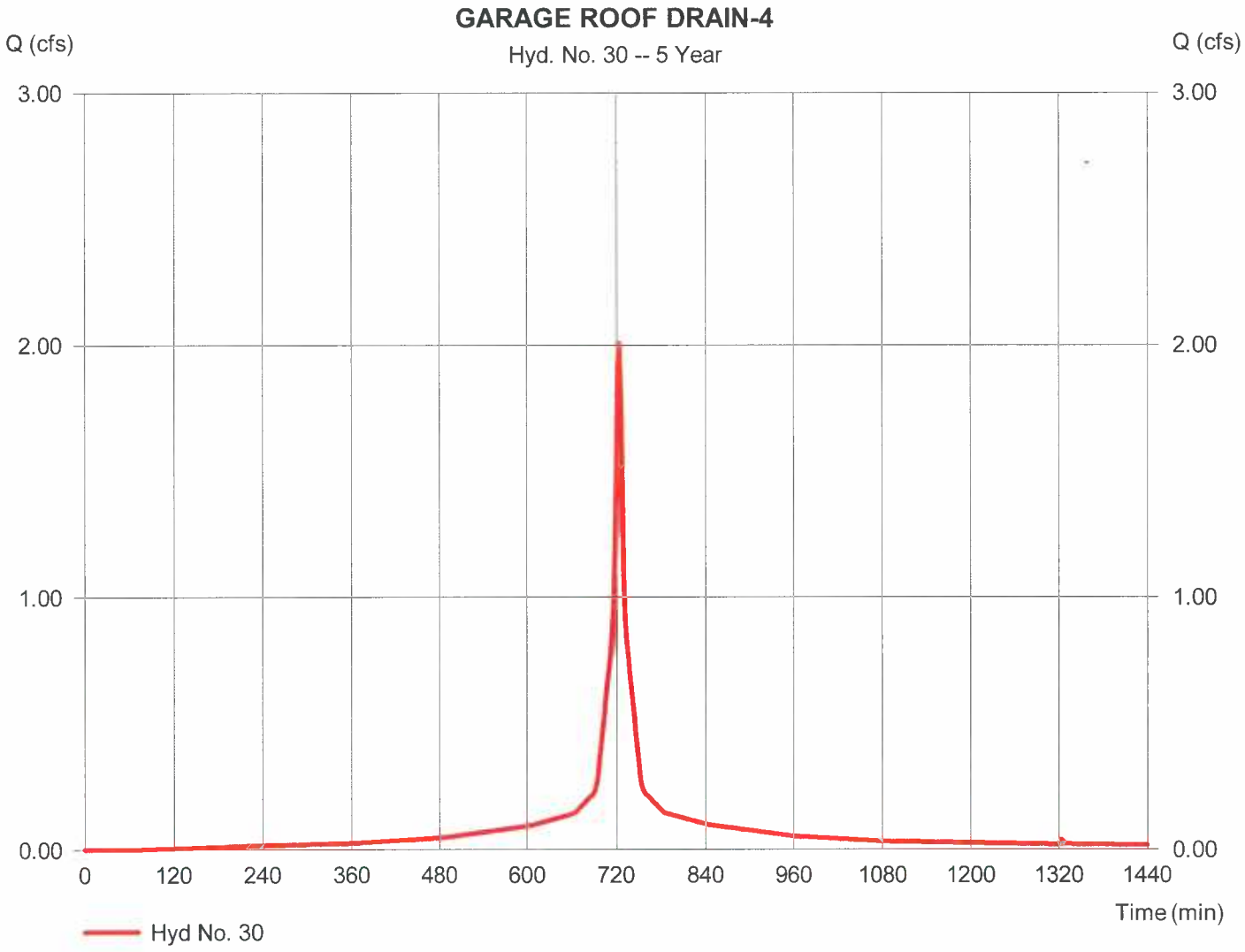


Hydrograph Report

Hyd. No. 30

GARAGE ROOF DRAIN-4

Hydrograph type	= SCS Runoff	Peak discharge	= 2.005 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 6,839 cuft
Drainage area	= 0.520 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



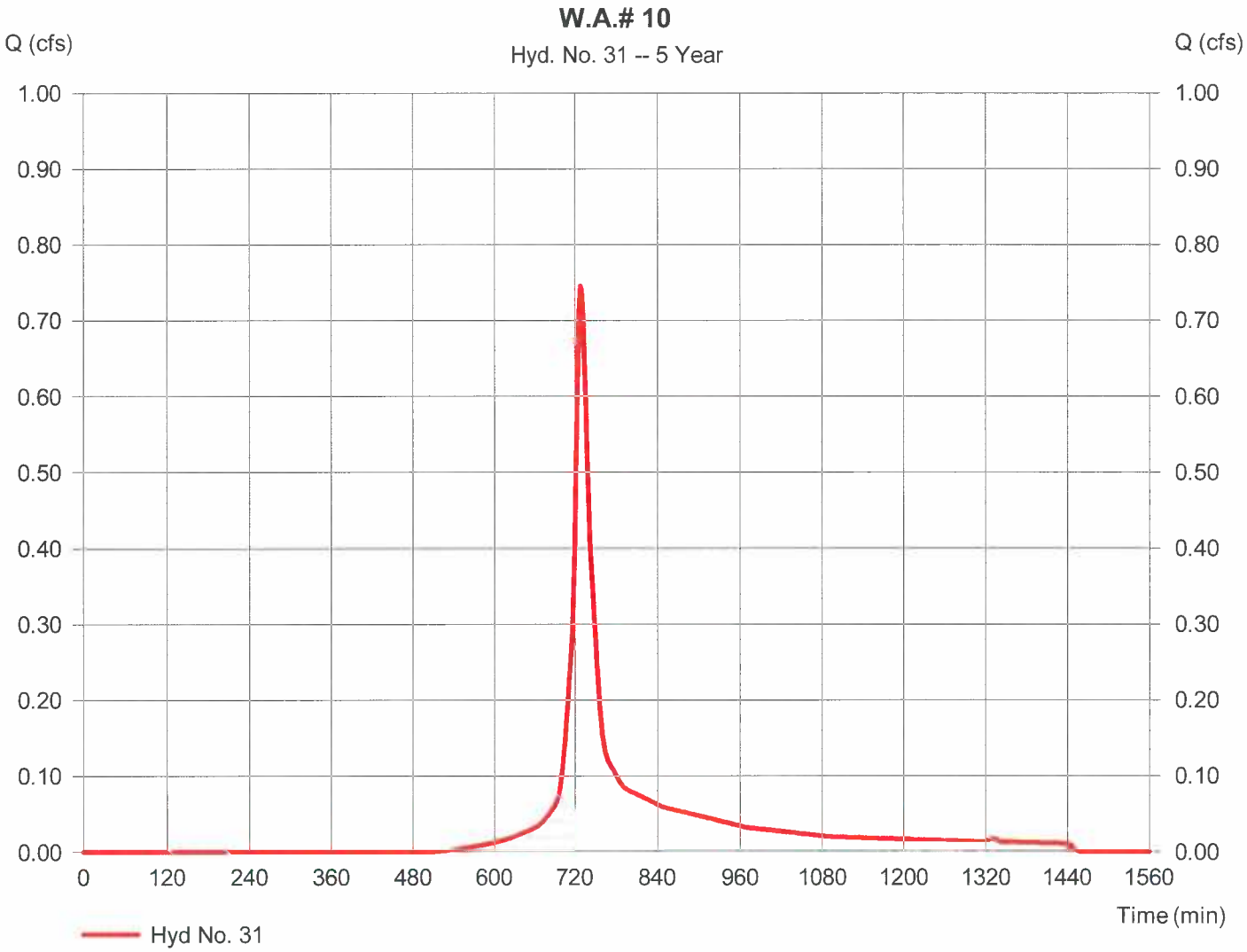
Hydrograph Report

Hyd. No. 31

W.A.# 10

Hydrograph type	= SCS Runoff	Peak discharge	= 0.745 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,863 cuft
Drainage area	= 0.360 ac	Curve number	= 80*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.240 x 71) + (0.120 x 98)] / 0.360



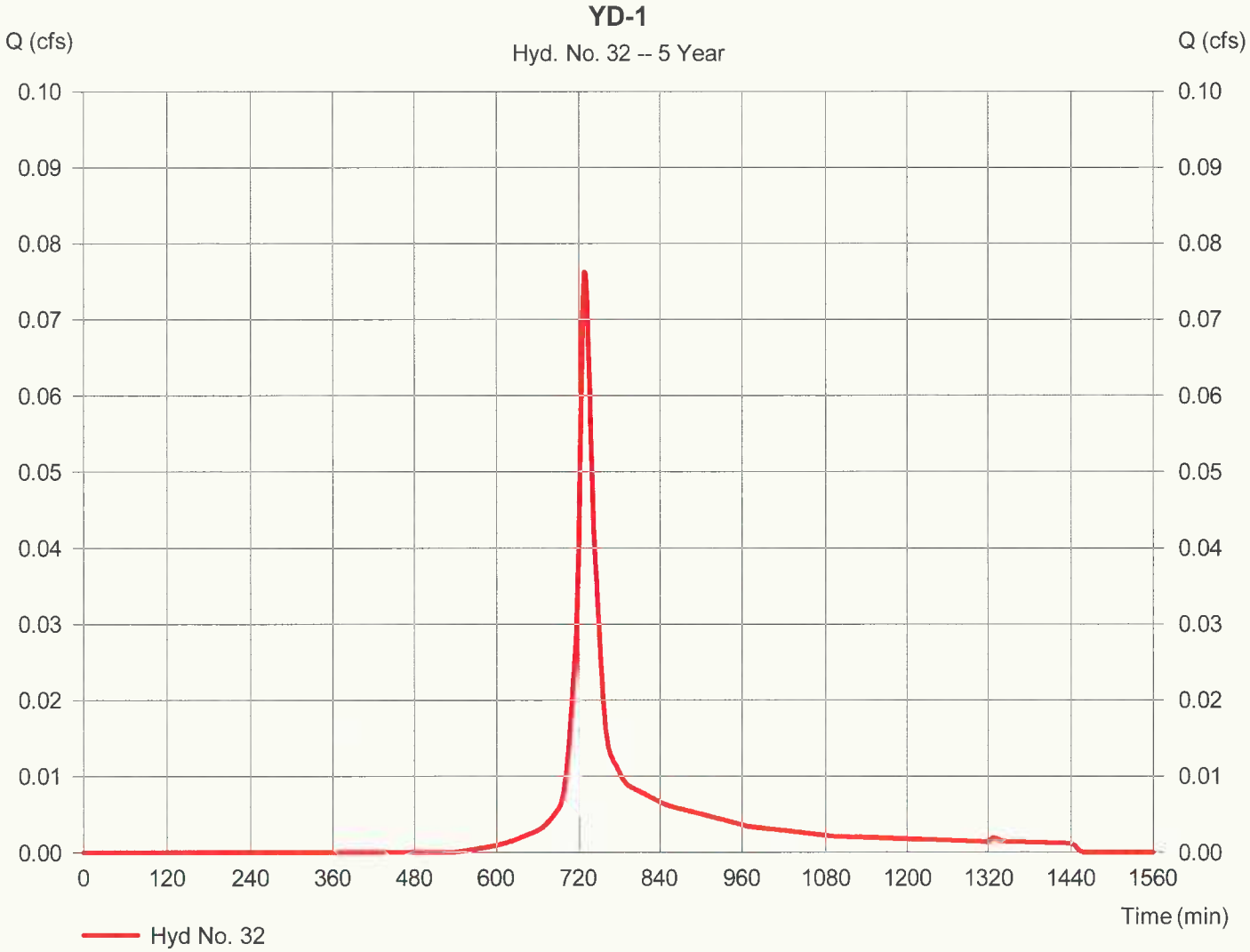
Hydrograph Report

Hyd. No. 32

YD-1

Hydrograph type	= SCS Runoff	Peak discharge	= 0.076 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 295 cuft
Drainage area	= 0.040 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.030 x 71) + (0.010 x 98)] / 0.040



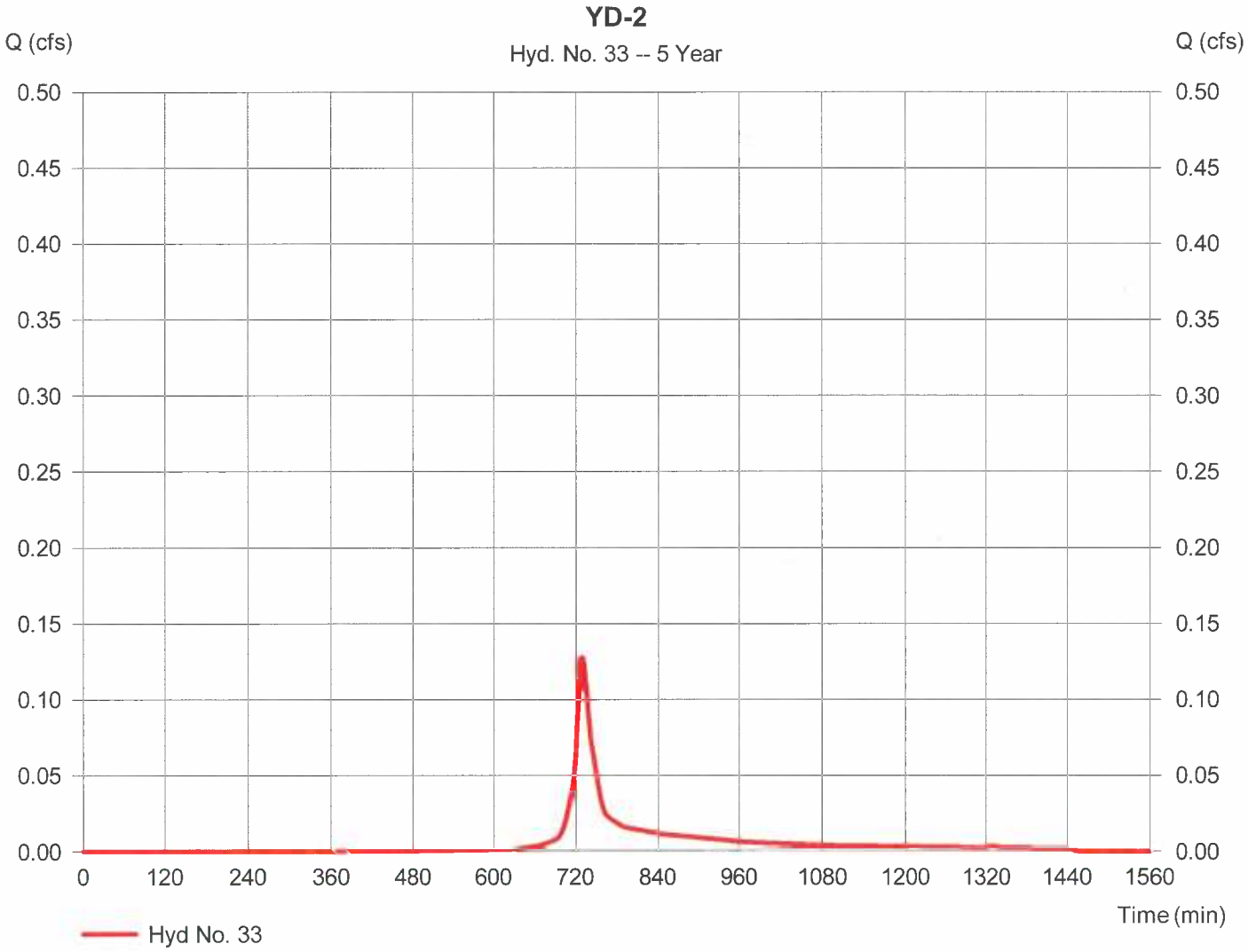
Hydrograph Report

Hyd. No. 33

YD-2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.128 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 500 cuft
Drainage area	= 0.080 ac	Curve number	= 74*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.070 x 71) + (0.010 x 98)] / 0.080



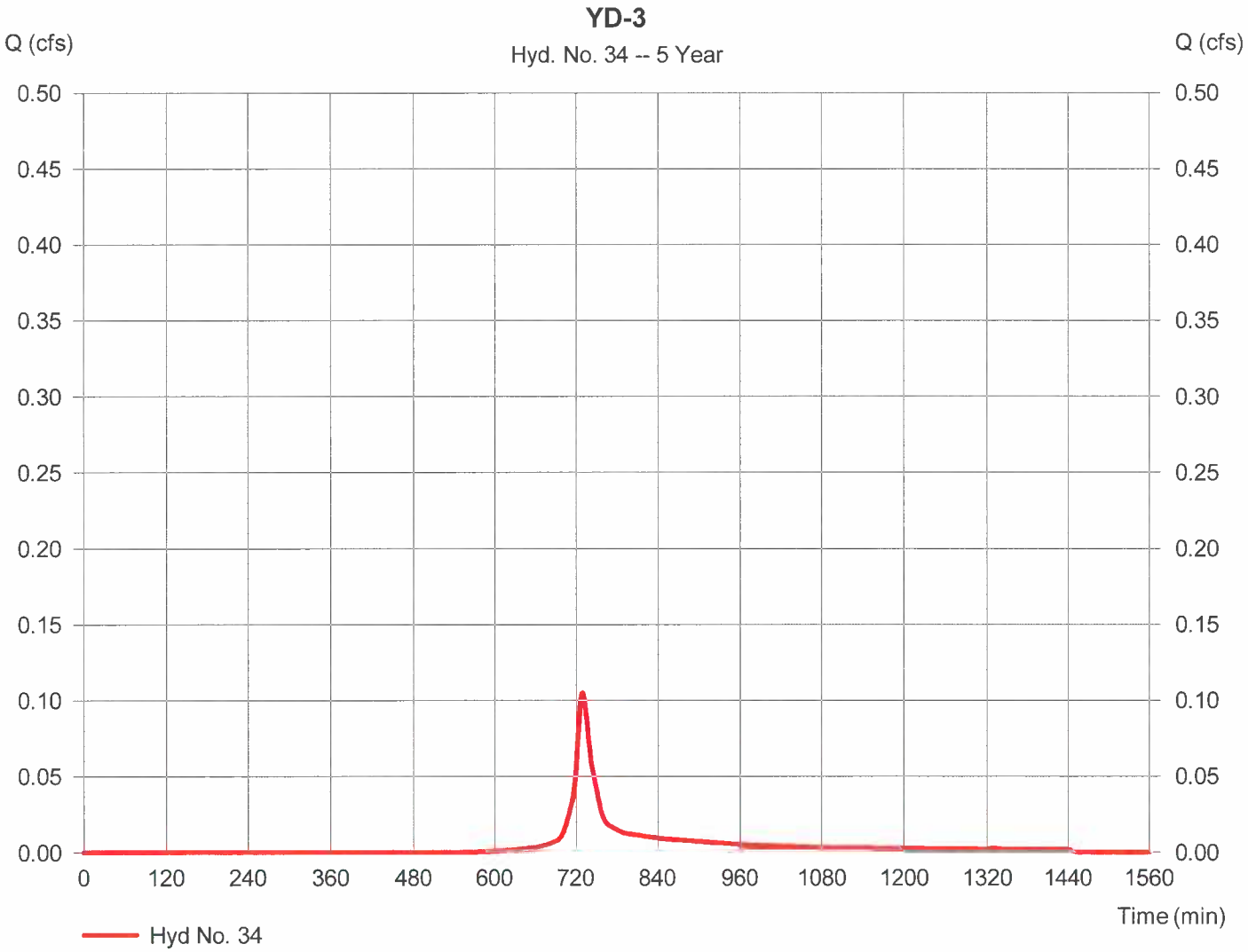
Hydrograph Report

Hyd. No. 34

YD-3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.105 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 408 cuft
Drainage area	= 0.060 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.050 x 71) + (0.010 x 98)] / 0.060



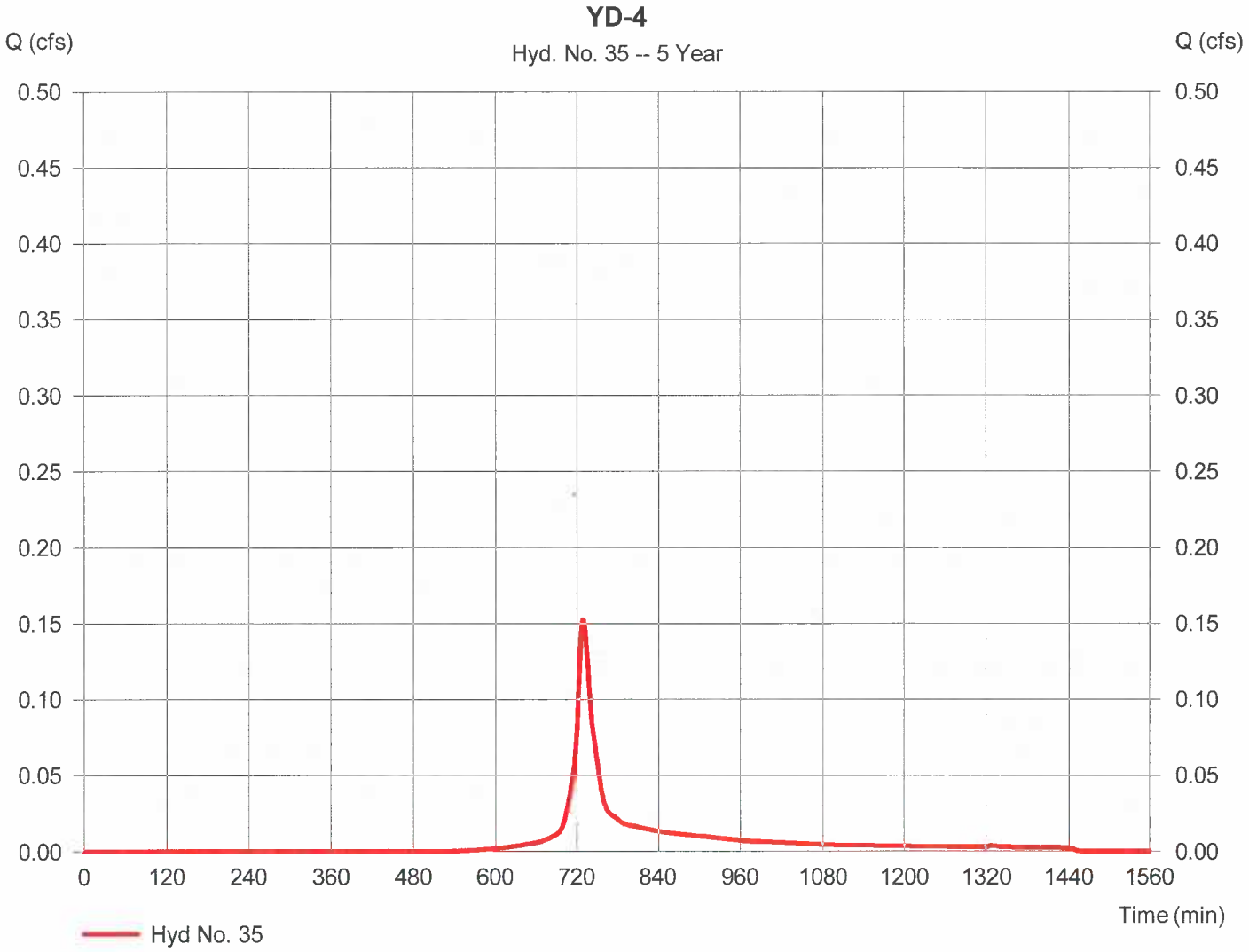
Hydrograph Report

Hyd. No. 35

YD-4

Hydrograph type	= SCS Runoff	Peak discharge	= 0.153 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 589 cuft
Drainage area	= 0.080 ac	Curve number	= 78*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.060 x 71) + (0.020 x 98)] / 0.080



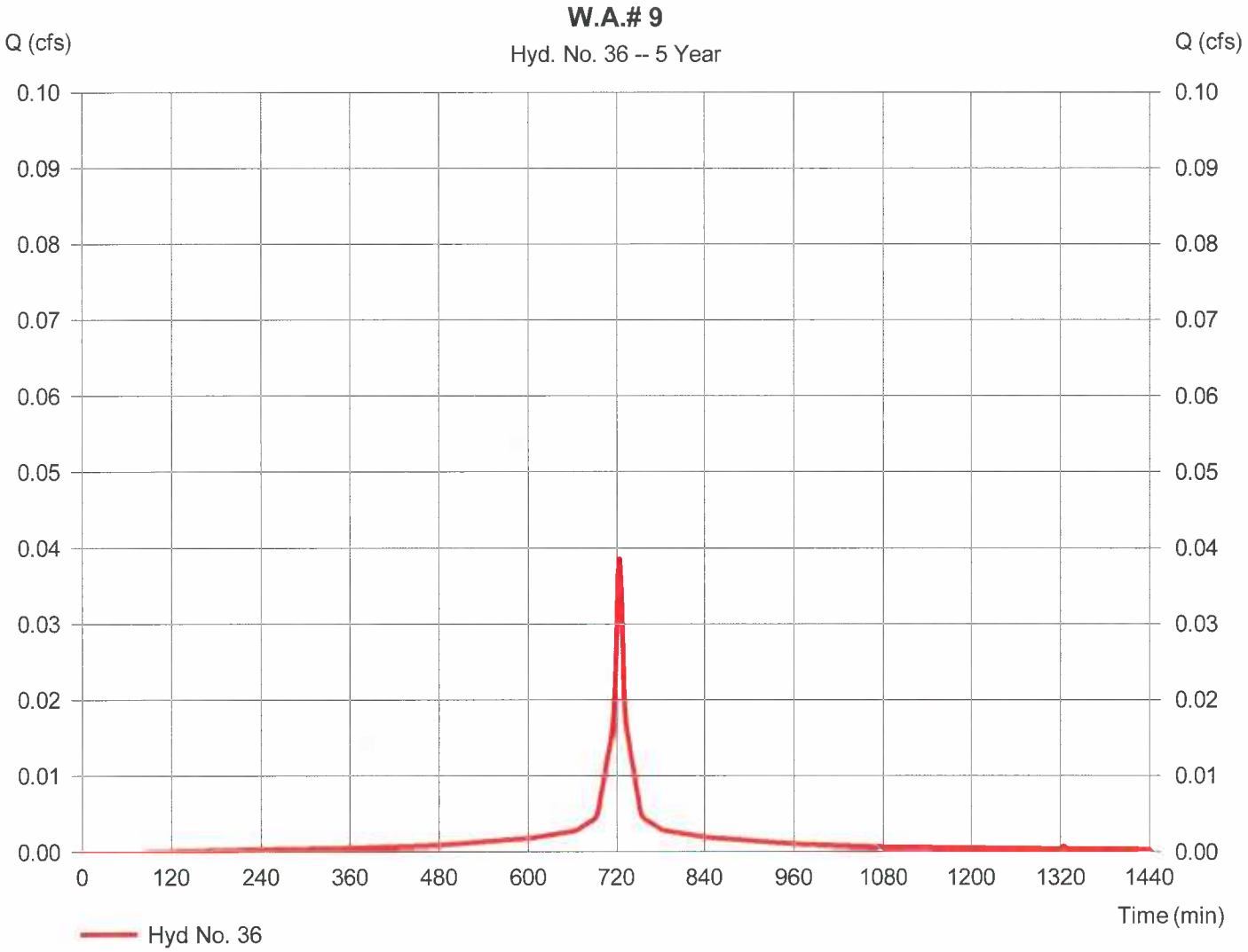
Hydrograph Report

Hyd. No. 36

W.A.# 9

Hydrograph type	= SCS Runoff	Peak discharge	= 0.039 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 132 cuft
Drainage area	= 0.010 ac	Curve number	= 98*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.010 x 98)] / 0.010



Hydrograph Report

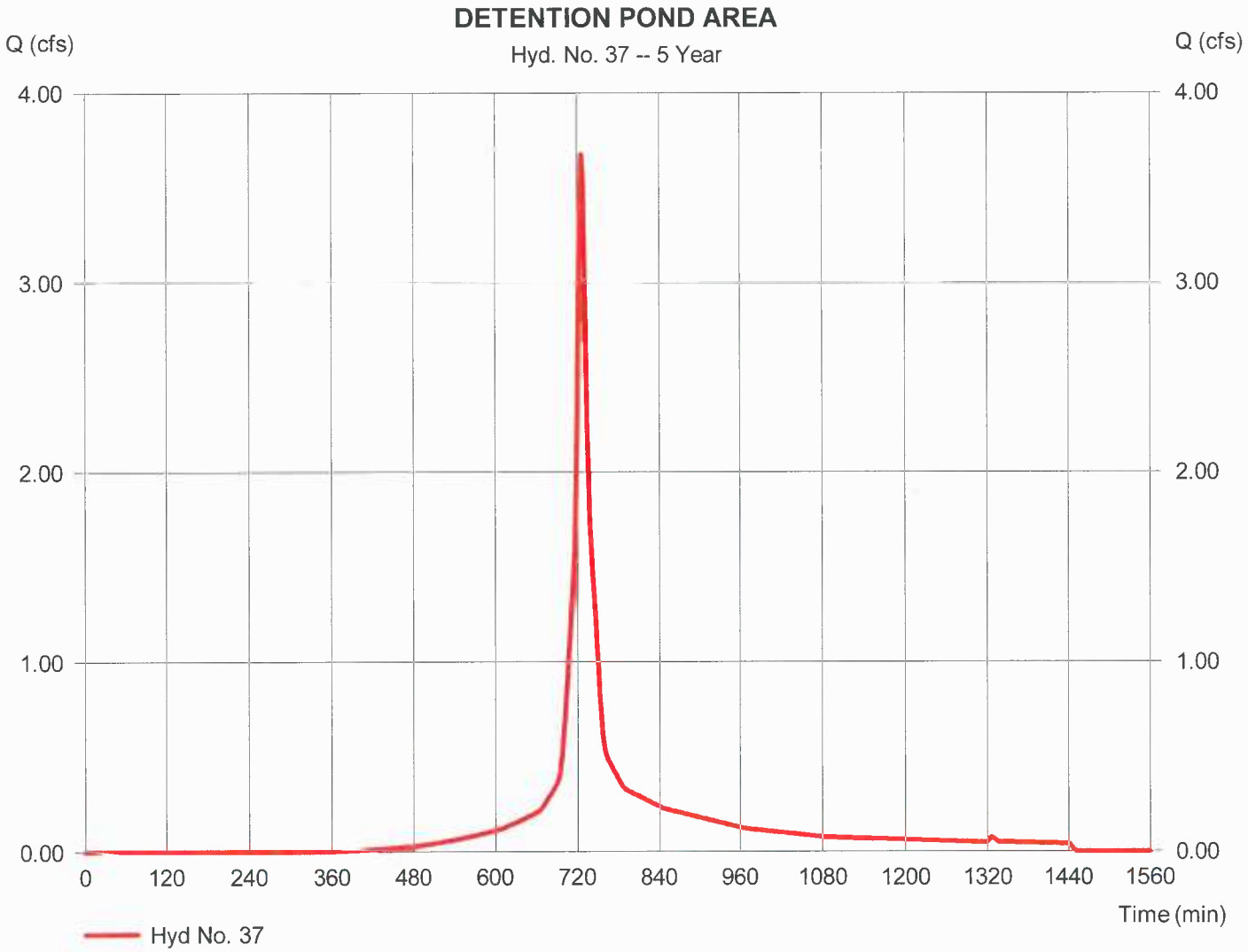
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 Tuesday, 10 / 13 / 2015

Hyd. No. 37

DETENTION POND AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 3.675 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,702 cuft
Drainage area	= 1.240 ac	Curve number	= 88*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.330 x 74) + (0.160 x 71) + (0.750 x 98)] / 1.240



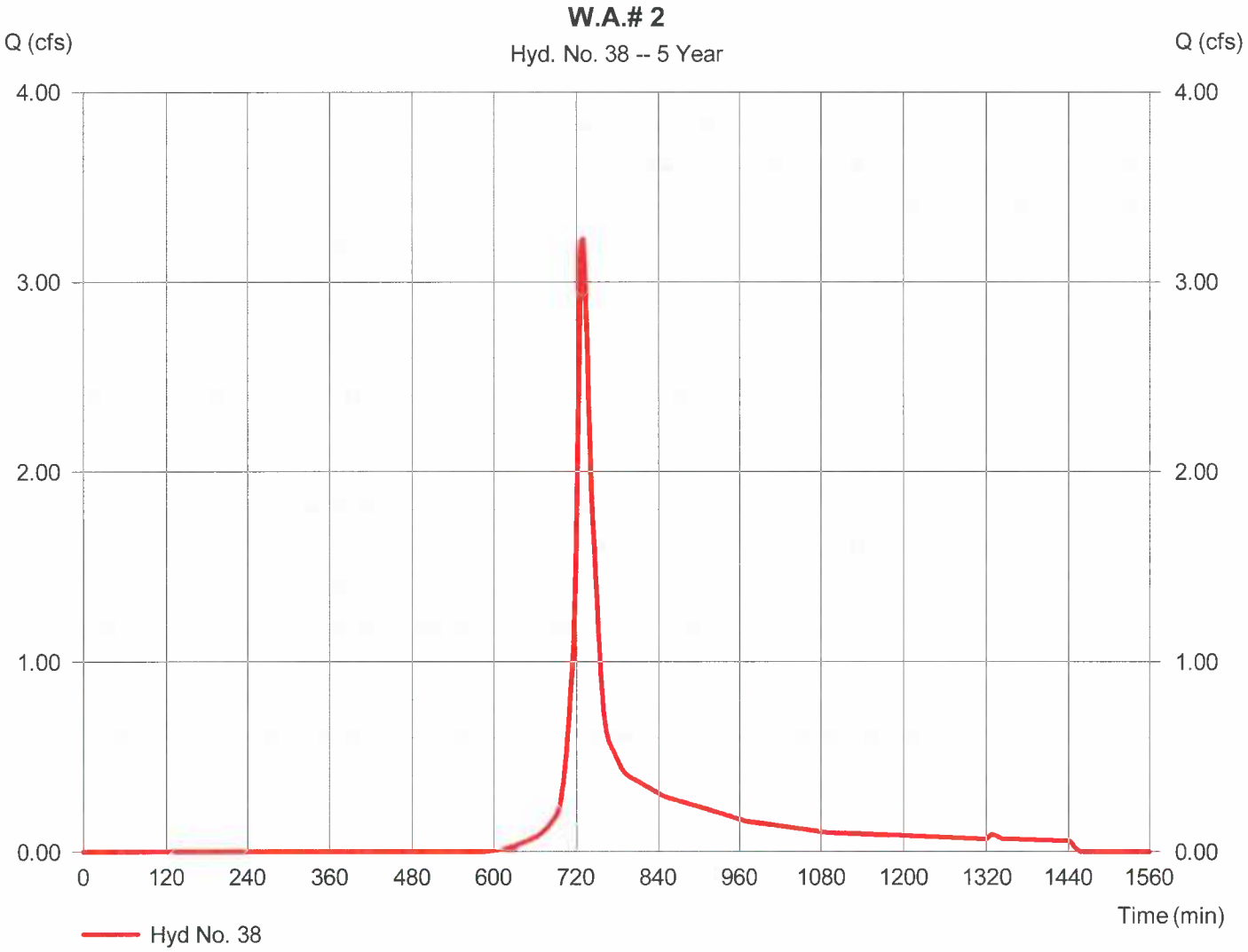
Hydrograph Report

Hyd. No. 38

W.A.# 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.227 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 12,695 cuft
Drainage area	= 2.120 ac	Curve number	= 73*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 4.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.670 x 74) + (0.270 x 71) + (0.180 x 61)] / 2.120

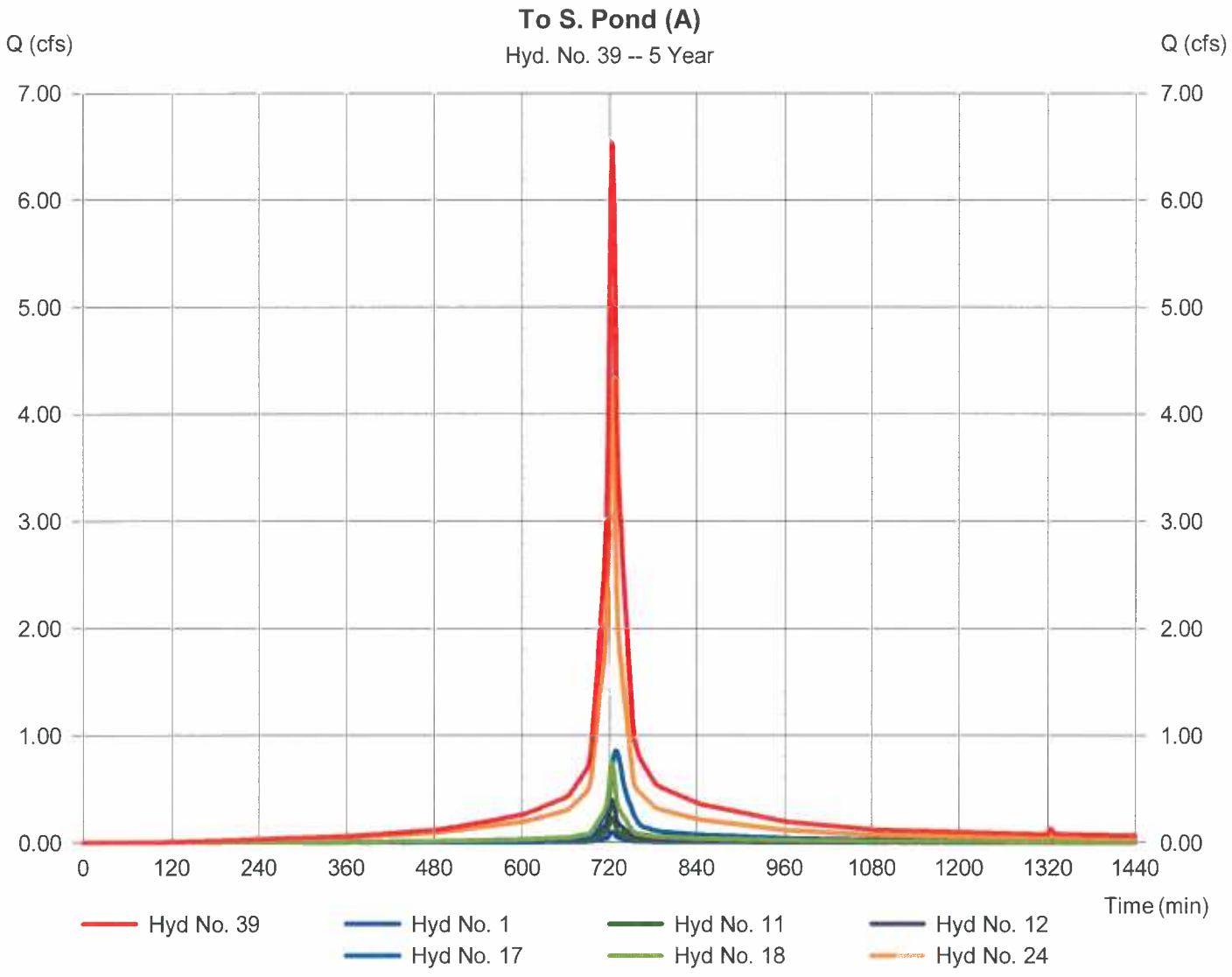


Hydrograph Report

Hyd. No. 39

To S. Pond (A)

Hydrograph type	= Combine	Peak discharge	= 6.521 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 22,596 cuft
Inflow hyds.	= 1, 11, 12, 17, 18, 24	Contrib. drain. area	= 1.990 ac

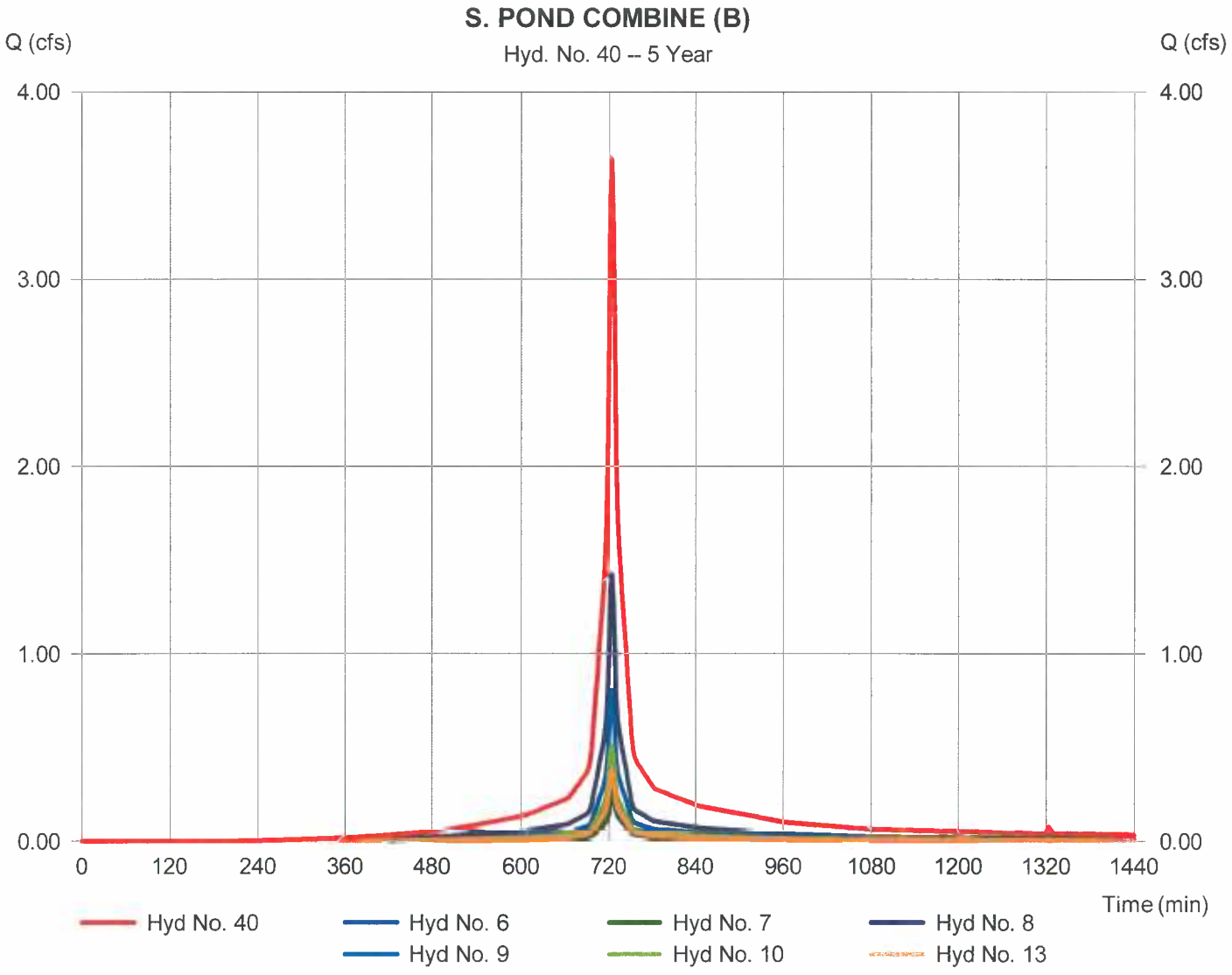


Hydrograph Report

Hyd. No. 40

S. POND COMBINE (B)

Hydrograph type	= Combine	Peak discharge	= 3.636 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 11,634 cuft
Inflow hyds.	= 6, 7, 8, 9, 10, 13	Contrib. drain. area	= 1.030 ac

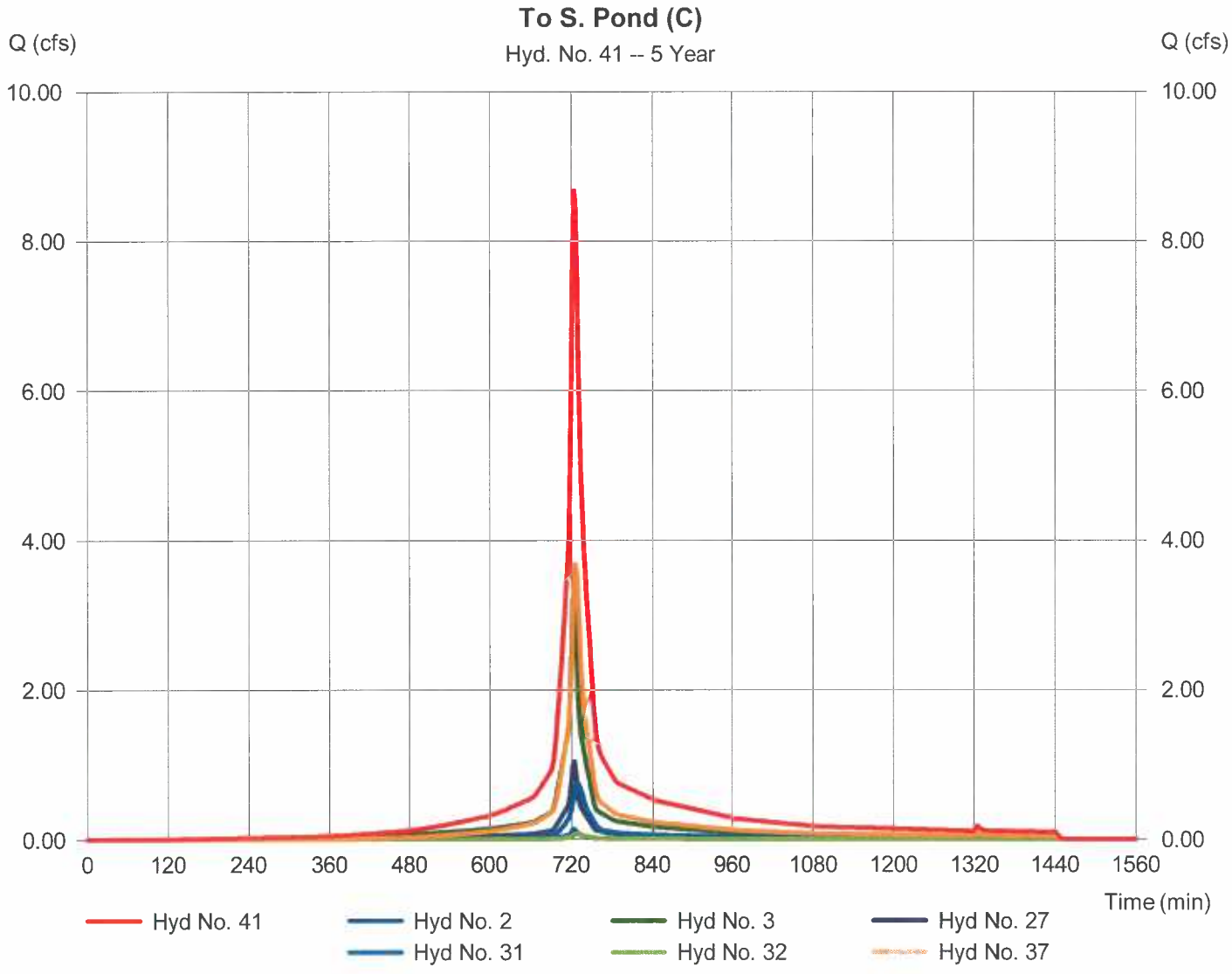


Hydrograph Report

Hyd. No. 41

To S. Pond (C)

Hydrograph type	= Combine	Peak discharge	= 8.673 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 30,857 cuft
Inflow hyds.	= 2, 3, 27, 31, 32, 37	Contrib. drain. area	= 2.840 ac

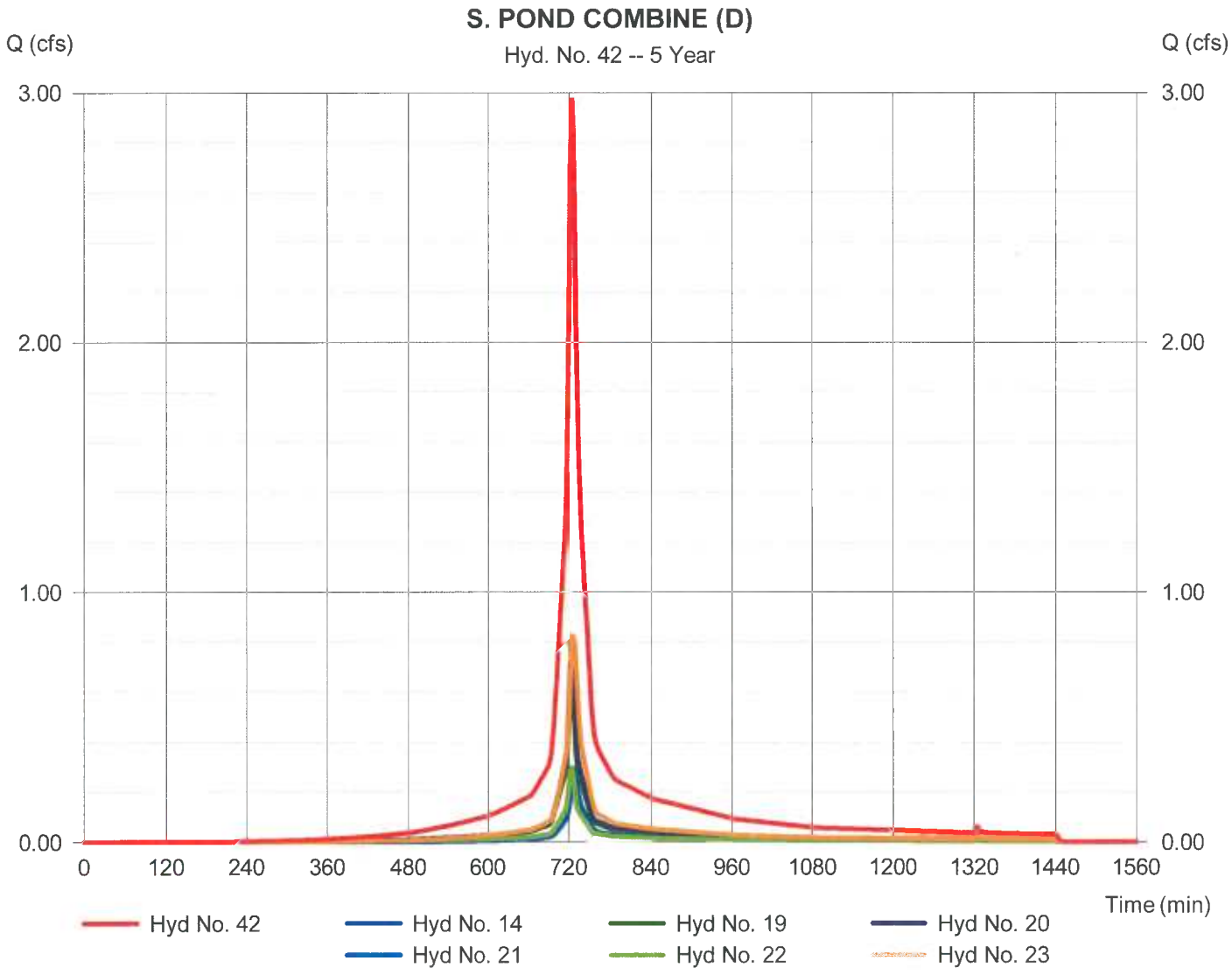


Hydrograph Report

Hyd. No. 42

S. POND COMBINE (D)

Hydrograph type	= Combine	Peak discharge	= 2.973 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 10,087 cuft
Inflow hyds.	= 14, 19, 20, 21, 22, 23	Contrib. drain. area	= 0.930 ac

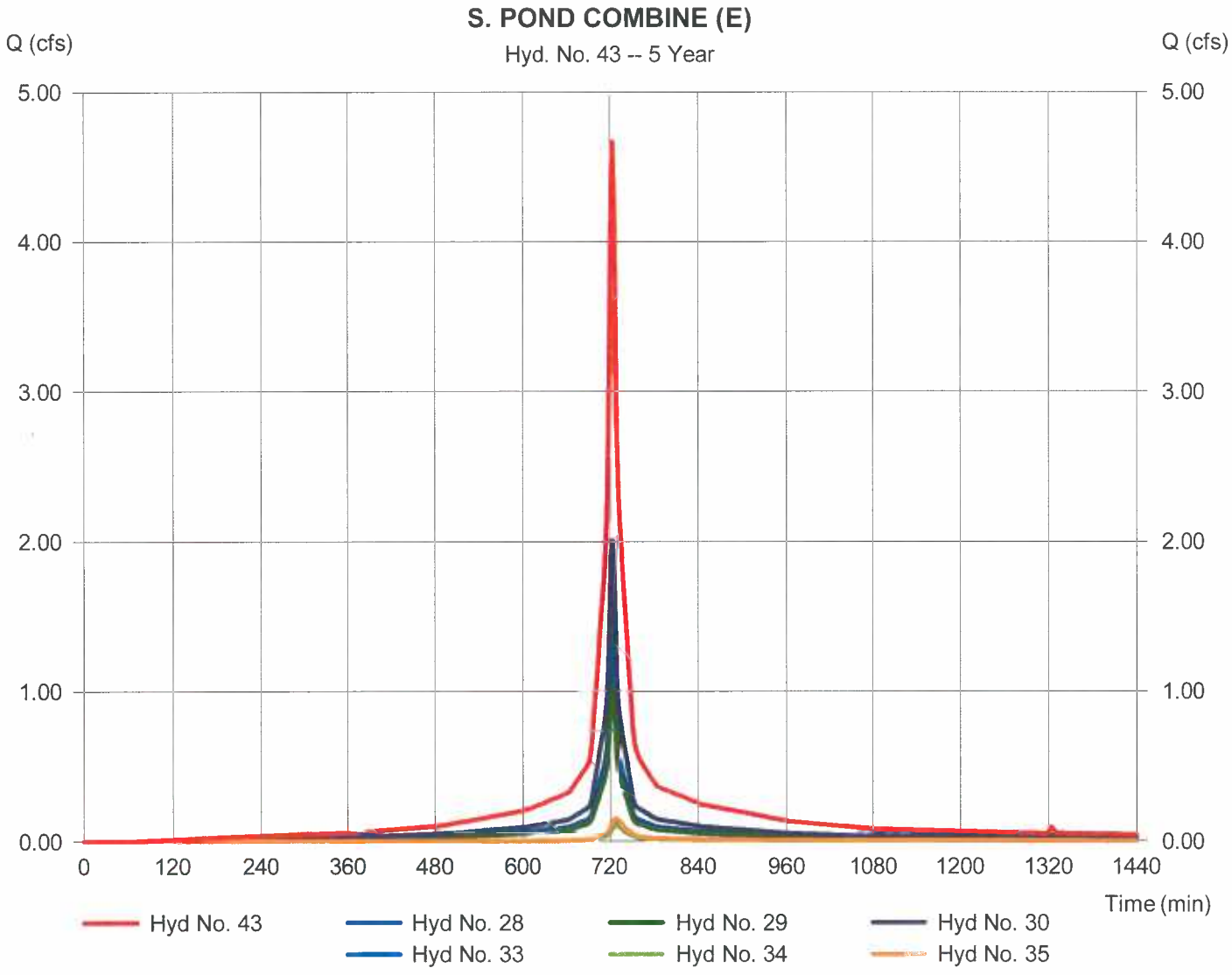


Hydrograph Report

Hyd. No. 43

S. POND COMBINE (E)

Hydrograph type	= Combine	Peak discharge	= 4.669 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 16,359 cuft
Inflow hyds.	= 28, 29, 30, 33, 34, 35	Contrib. drain. area	= 1.350 ac

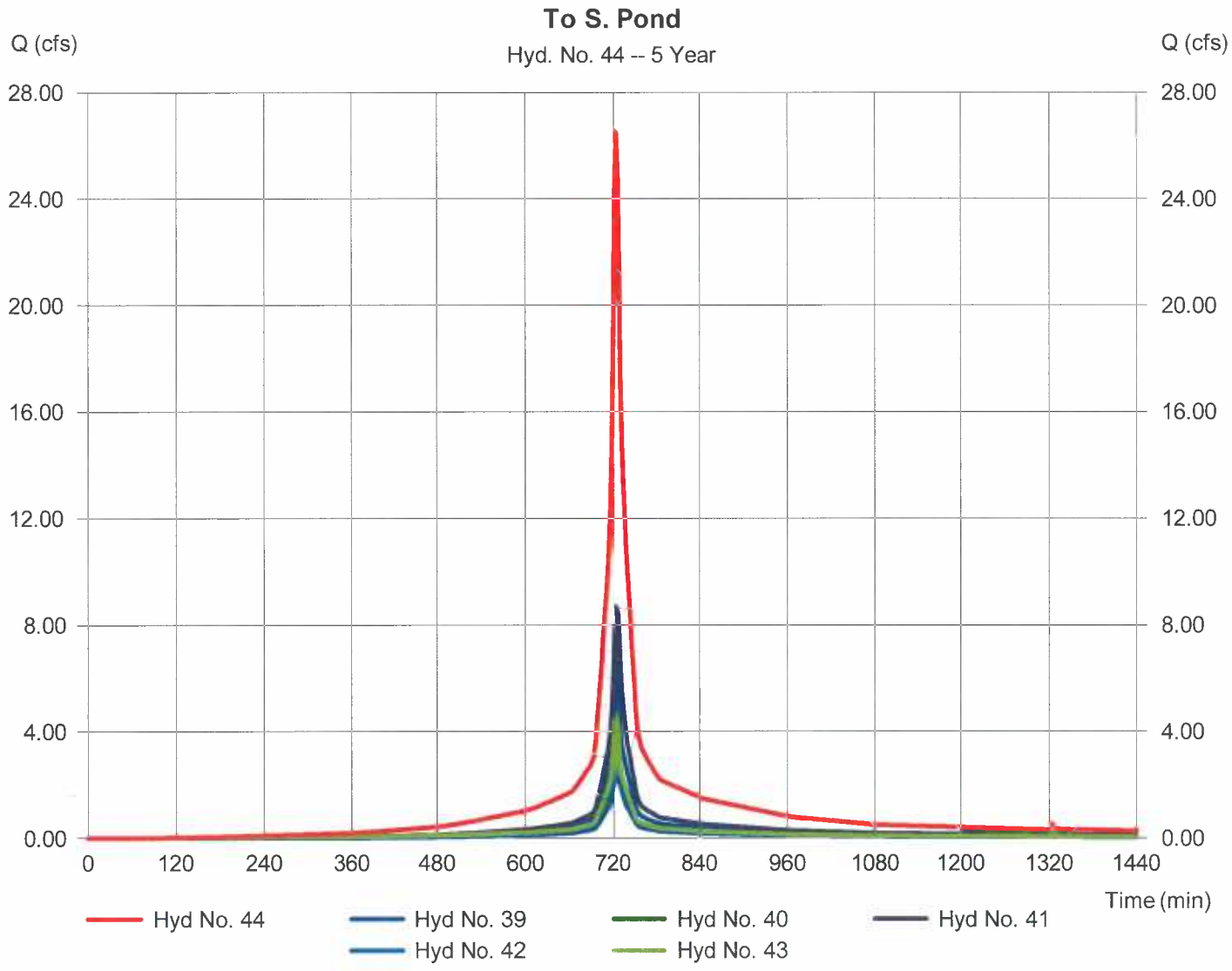


Hydrograph Report

Hyd. No. 44

To S. Pond

Hydrograph type	= Combine	Peak discharge	= 26.47 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 91,534 cuft
Inflow hyds.	= 39, 40, 41, 42, 43	Contrib. drain. area	= 0.000 ac



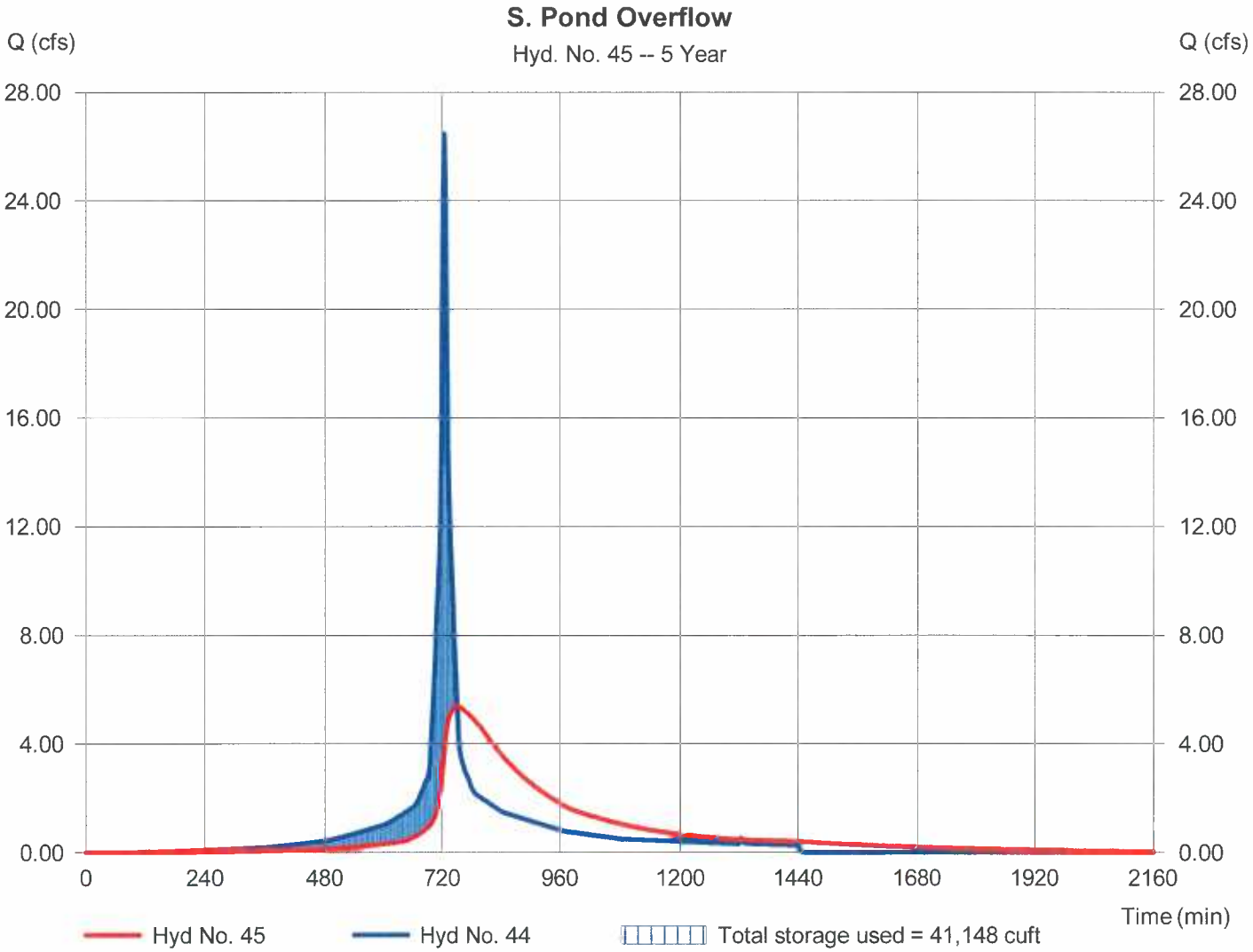
Hydrograph Report

Hyd. No. 45

S. Pond Overflow

Hydrograph type	= Reservoir	Peak discharge	= 5.400 cfs
Storm frequency	= 5 yrs	Time to peak	= 750 min
Time interval	= 2 min	Hyd. volume	= 91,514 cuft
Inflow hyd. No.	= 44 - To S. Pond	Max. Elevation	= 45.17 ft
Reservoir name	= South Pond	Max. Storage	= 41,148 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - South Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 43.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	43.50	17,651	0	0
3.50	47.00	32,417	86,311	86,311
4.00	47.50	34,583	16,745	103,057

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	17.00	Inactive	0.00
Span (in)	= 24.00	17.00	14.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 43.50	43.50	45.00	0.00
Length (ft)	= 41.00	0.00	0.00	0.00
Slope (%)	= 0.60	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

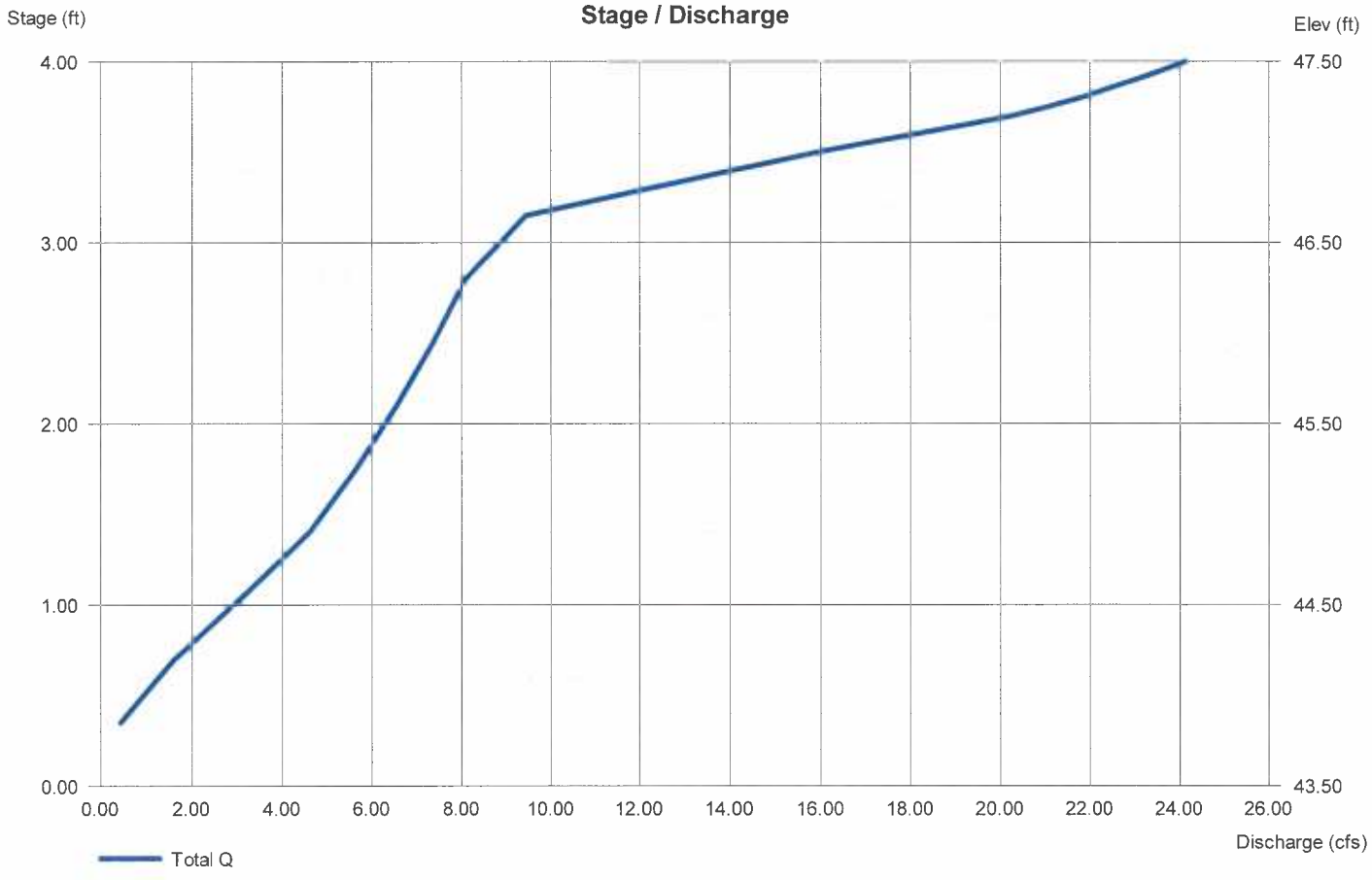
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 7.33	Inactive	0.00	0.00
Crest El. (ft)	= 46.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

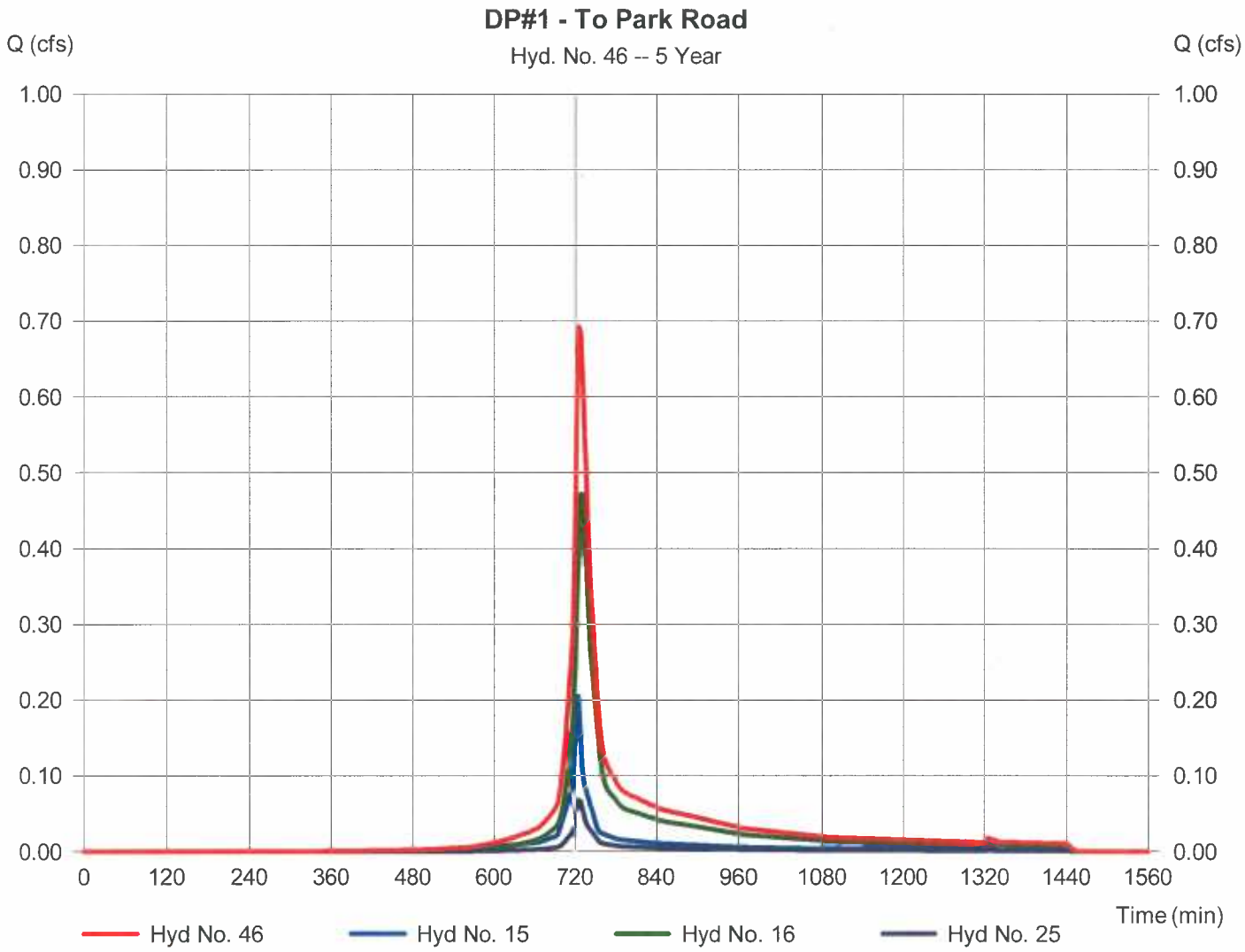


Hydrograph Report

Hyd. No. 46

DP#1 - To Park Road

Hydrograph type	= Combine	Peak discharge	= 0.692 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,702 cuft
Inflow hyds.	= 15, 16, 25	Contrib. drain. area	= 0.360 ac

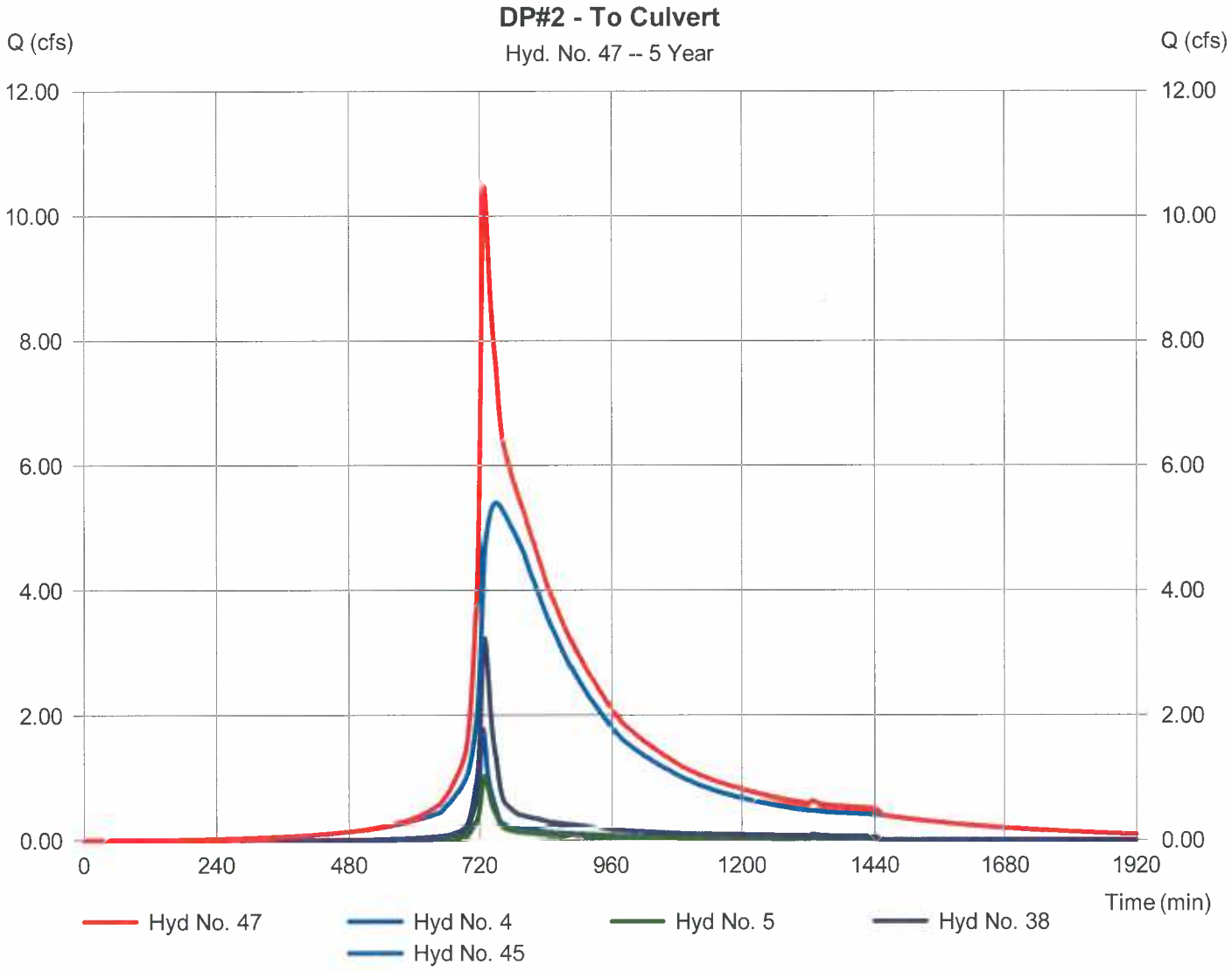


Hydrograph Report

Hyd. No. 47

DP#2 - To Culvert

Hydrograph type	= Combine	Peak discharge	= 10.46 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 114,296 cuft
Inflow hyds.	= 4, 5, 38, 45	Contrib. drain. area	= 3.520 ac

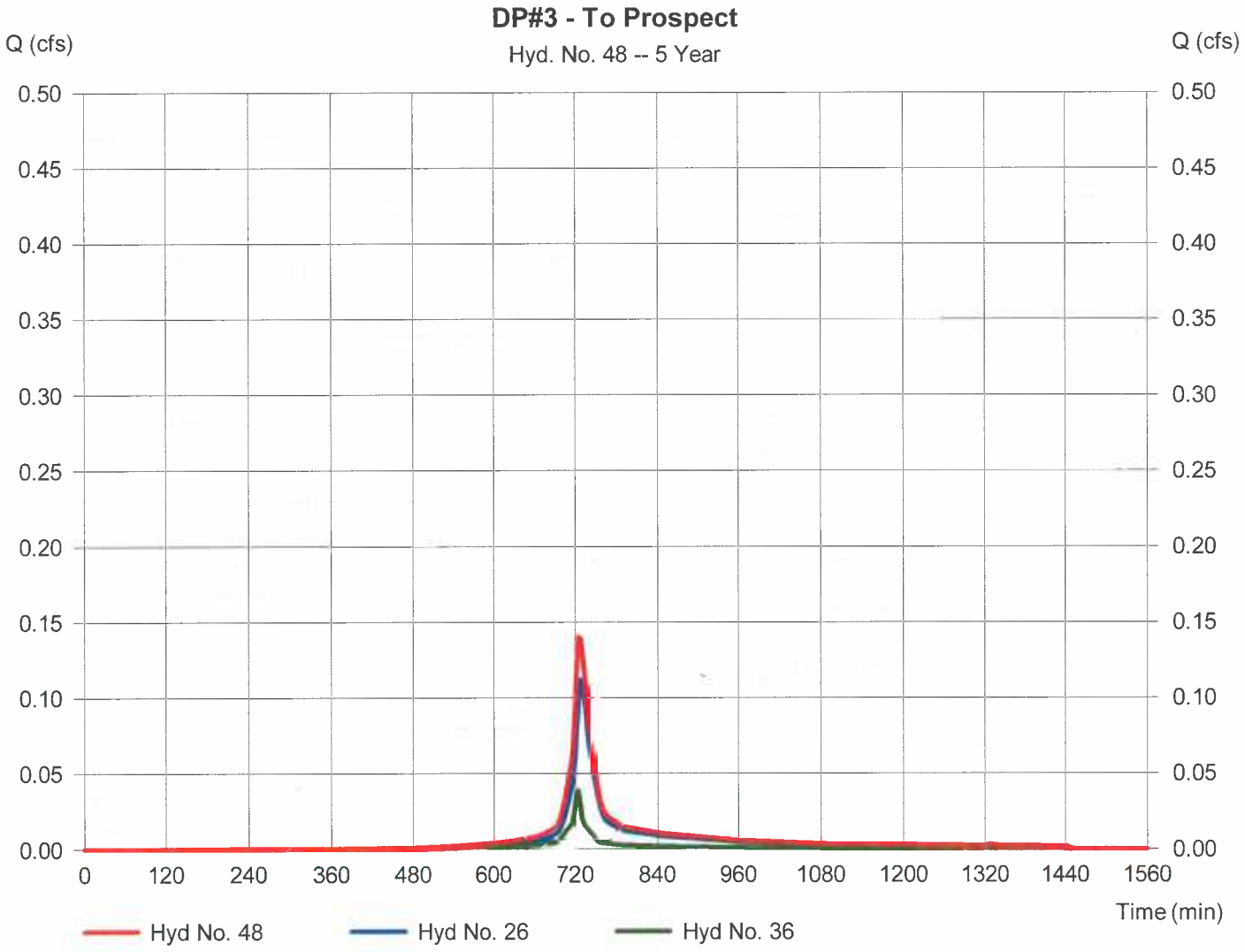


Hydrograph Report

Hyd. No. 48

DP#3 - To Prospect

Hydrograph type	= Combine	Peak discharge	= 0.140 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 560 cuft
Inflow hyds.	= 26, 36	Contrib. drain. area	= 0.060 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.116	2	724	356	------	------	------	CB-1
2	SCS Runoff	0.161	2	724	502	------	------	------	CB-2
3	SCS Runoff	3.872	2	724	12,825	------	------	------	SOUTH PARKING AREA
4	SCS Runoff	2.199	2	726	7,509	------	------	------	W.A.# 3
5	SCS Runoff	1.313	2	728	5,097	------	------	------	W.A.# 4
6	SCS Runoff	0.344	2	724	1,122	------	------	------	CB-3
7	SCS Runoff	0.282	2	726	983	------	------	------	CB-4
8	SCS Runoff	1.653	2	724	5,325	------	------	------	CB-5
9	SCS Runoff	0.942	2	724	2,972	------	------	------	CB-6
10	SCS Runoff	0.593	2	724	1,912	------	------	------	CB-7
11	SCS Runoff	0.266	2	724	911	------	------	------	CB-8
12	SCS Runoff	0.459	2	724	1,461	------	------	------	CB-9
13	SCS Runoff	0.442	2	724	1,382	------	------	------	TD-2
14	SCS Runoff	0.277	2	726	949	------	------	------	Sisters Courtyard
15	SCS Runoff	0.241	2	724	754	------	------	------	W.A.# 5
16	SCS Runoff	0.600	2	728	2,315	------	------	------	W.A.# 6
17	SCS Runoff	1.079	2	728	4,142	------	------	------	W.A.# 1
18	SCS Runoff	0.860	2	724	2,806	------	------	------	CB-10
19	SCS Runoff	0.763	2	724	2,458	------	------	------	CB-11
20	SCS Runoff	0.876	2	724	2,790	------	------	------	CB-12
21	SCS Runoff	0.353	2	726	1,229	------	------	------	CB-13
22	SCS Runoff	0.344	2	724	1,122	------	------	------	TD-3
23	SCS Runoff	0.976	2	726	3,416	------	------	------	TD-1
24	SCS Runoff	5.010	2	724	16,869	------	------	------	W.A.# 11
25	SCS Runoff	0.084	2	726	287	------	------	------	W.A.# 7
26	SCS Runoff	0.137	2	728	526	------	------	------	W.A.# 8
27	SCS Runoff	1.196	2	724	4,101	------	------	------	GARAGE ROOF DRAIN-2
28	SCS Runoff	1.506	2	724	5,165	------	------	------	GARAGE ROOF DRAIN-1
29	SCS Runoff	1.196	2	724	4,101	------	------	------	GARAGE ROOF DRAIN-3
30	SCS Runoff	2.303	2	724	7,899	------	------	------	GARAGE ROOF DRAIN-4
31	SCS Runoff	0.926	2	728	3,548	------	------	------	W.A.# 10
32	SCS Runoff	0.096	2	728	368	------	------	------	YD-1
33	SCS Runoff	0.164	2	728	637	------	------	------	YD-2
34	SCS Runoff	0.133	2	728	514	------	------	------	YD-3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SCS Runoff	0.192	2	728	736	------	------	------	YD-4
36	SCS Runoff	0.044	2	724	152	------	------	------	W.A.# 9
37	SCS Runoff	4.378	2	726	15,235	------	------	------	DETENTION POND AREA
38	SCS Runoff	4.174	2	730	16,251	------	------	------	W.A.# 2
39	Combine	7.601	2	724	26,546	1, 11, 12,	------	------	To S. Pond (A)
40	Combine	4.241	2	724	13,696	17, 18, 24, 6, 7, 8,	------	------	S. POND COMBINE (B)
41	Combine	10.21	2	724	36,581	9, 10, 13, 2, 3, 27,	------	------	To S. Pond (C)
42	Combine	3.498	2	724	11,963	31, 32, 37, 14, 19, 20,	------	------	S. POND COMBINE (D)
43	Combine	5.405	2	724	19,053	21, 22, 23, 28, 29, 30,	------	------	S. POND COMBINE (E)
44	Combine	30.96	2	724	107,839	33, 34, 35, 39, 40, 41,	------	------	To S. Pond
45	Reservoir	6.170	2	750	107,819	42, 43 44	45.45	48,138	S. Pond Overflow
46	Combine	0.863	2	726	3,356	15, 16, 25,	------	------	DP#1 - To Park Road
47	Combine	12.75	2	730	136,677	4, 5, 38,	------	------	DP#2 - To Culvert
48	Combine	0.169	2	726	678	45, 26, 36,	------	------	DP#3 - To Prospect

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.140	2	724	434	------	------	------	CB-1
2	SCS Runoff	0.193	2	724	608	------	------	------	CB-2
3	SCS Runoff	4.559	2	724	15,234	------	------	------	SOUTH PARKING AREA
4	SCS Runoff	2.764	2	726	9,466	------	------	------	W.A.# 3
5	SCS Runoff	1.724	2	728	6,634	------	------	------	W.A.# 4
6	SCS Runoff	0.406	2	724	1,338	------	------	------	CB-3
7	SCS Runoff	0.343	2	726	1,204	------	------	------	CB-4
8	SCS Runoff	1.957	2	724	6,373	------	------	------	CB-5
9	SCS Runoff	1.124	2	724	3,584	------	------	------	CB-6
10	SCS Runoff	0.703	2	724	2,288	------	------	------	CB-7
11	SCS Runoff	0.311	2	724	1,075	------	------	------	CB-8
12	SCS Runoff	0.545	2	724	1,756	------	------	------	CB-9
13	SCS Runoff	0.529	2	724	1,673	------	------	------	TD-2
14	SCS Runoff	0.345	2	726	1,186	------	------	------	Sisters Courtyard
15	SCS Runoff	0.289	2	724	912	------	------	------	W.A.# 5
16	SCS Runoff	0.778	2	728	2,985	------	------	------	W.A.# 6
17	SCS Runoff	1.381	2	728	5,291	------	------	------	W.A.# 1
18	SCS Runoff	1.015	2	724	3,345	------	------	------	CB-10
19	SCS Runoff	0.903	2	724	2,941	------	------	------	CB-11
20	SCS Runoff	1.041	2	724	3,351	------	------	------	CB-12
21	SCS Runoff	0.429	2	726	1,505	------	------	------	CB-13
22	SCS Runoff	0.406	2	724	1,338	------	------	------	TD-3
23	SCS Runoff	1.180	2	726	4,168	------	------	------	TD-1
24	SCS Runoff	5.884	2	724	19,962	------	------	------	W.A.# 11
25	SCS Runoff	0.106	2	726	363	------	------	------	W.A.# 7
26	SCS Runoff	0.172	2	728	661	------	------	------	W.A.# 8
27	SCS Runoff	1.402	2	724	4,835	------	------	------	GARAGE ROOF DRAIN-2
28	SCS Runoff	1.765	2	724	6,089	------	------	------	GARAGE ROOF DRAIN-1
29	SCS Runoff	1.402	2	724	4,835	------	------	------	GARAGE ROOF DRAIN-3
30	SCS Runoff	2.699	2	724	9,313	------	------	------	GARAGE ROOF DRAIN-4
31	SCS Runoff	1.171	2	728	4,492	------	------	------	W.A.# 10
32	SCS Runoff	0.123	2	728	470	------	------	------	YD-1
33	SCS Runoff	0.215	2	728	829	------	------	------	YD-2
34	SCS Runoff	0.173	2	728	663	------	------	------	YD-3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SCS Runoff	0.245	2	728	941	------	------	------	YD-4
36	SCS Runoff	0.052	2	724	179	------	------	------	W.A.# 9
37	SCS Runoff	5.314	2	726	18,661	------	------	------	DETENTION POND AREA
38	SCS Runoff	5.512	2	728	21,260	------	------	------	W.A.# 2
39	Combine	9.045	2	724	31,863	1, 11, 12,	------	------	To S. Pond (A)
40	Combine	5.044	2	724	16,459	17, 18, 24, 6, 7, 8,	------	------	S. POND COMBINE (B)
41	Combine	12.26	2	724	44,301	9, 10, 13, 2, 3, 27,	------	------	To S. Pond (C)
42	Combine	4.197	2	724	14,489	31, 32, 37, 14, 19, 20,	------	------	S. POND COMBINE (D)
43	Combine	6.391	2	724	22,670	21, 22, 23, 28, 29, 30,	------	------	S. POND COMBINE (E)
44	Combine	36.94	2	724	129,783	33, 34, 35, 39, 40, 41,	------	------	To S. Pond
45	Reservoir	7.095	2	752	129,764	42, 43 44	45.84	57,566	S. Pond Overflow
46	Combine	1.098	2	726	4,260	15, 16, 25,	------	------	DP#1 - To Park Road
47	Combine	15.83	2	728	167,124	4, 5, 38,	------	------	DP#2 - To Culvert
48	Combine	0.209	2	726	840	45, 26, 36,	------	------	DP#3 - To Prospect

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.160	2	724	503	------	------	------	CB-1
2	SCS Runoff	0.220	2	724	701	------	------	------	CB-2
3	SCS Runoff	5.157	2	724	17,345	------	------	------	SOUTH PARKING AREA
4	SCS Runoff	3.264	2	726	11,219	------	------	------	W.A.# 3
5	SCS Runoff	2.095	2	728	8,035	------	------	------	W.A.# 4
6	SCS Runoff	0.460	2	724	1,527	------	------	------	CB-3
7	SCS Runoff	0.396	2	726	1,399	------	------	------	CB-4
8	SCS Runoff	2.222	2	724	7,293	------	------	------	CB-5
9	SCS Runoff	1.282	2	724	4,122	------	------	------	CB-6
10	SCS Runoff	0.798	2	724	2,618	------	------	------	CB-7
11	SCS Runoff	0.351	2	724	1,217	------	------	------	CB-8
12	SCS Runoff	0.620	2	724	2,014	------	------	------	CB-9
13	SCS Runoff	0.605	2	724	1,929	------	------	------	TD-2
14	SCS Runoff	0.404	2	726	1,397	------	------	------	Sisters Courtyard
15	SCS Runoff	0.330	2	724	1,052	------	------	------	W.A.# 5
16	SCS Runoff	0.937	2	728	3,591	------	------	------	W.A.# 6
17	SCS Runoff	1.650	2	728	6,327	------	------	------	W.A.# 1
18	SCS Runoff	1.150	2	724	3,818	------	------	------	CB-10
19	SCS Runoff	1.026	2	724	3,366	------	------	------	CB-11
20	SCS Runoff	1.184	2	724	3,845	------	------	------	CB-12
21	SCS Runoff	0.494	2	726	1,749	------	------	------	CB-13
22	SCS Runoff	0.460	2	724	1,527	------	------	------	TD-3
23	SCS Runoff	1.357	2	726	4,831	------	------	------	TD-1
24	SCS Runoff	6.647	2	724	22,671	------	------	------	W.A.# 11
25	SCS Runoff	0.126	2	726	431	------	------	------	W.A.# 7
26	SCS Runoff	0.202	2	728	781	------	------	------	W.A.# 8
27	SCS Runoff	1.581	2	724	5,478	------	------	------	GARAGE ROOF DRAIN-2
28	SCS Runoff	1.992	2	724	6,898	------	------	------	GARAGE ROOF DRAIN-1
29	SCS Runoff	1.581	2	724	5,478	------	------	------	GARAGE ROOF DRAIN-3
30	SCS Runoff	3.046	2	724	10,550	------	------	------	GARAGE ROOF DRAIN-4
31	SCS Runoff	1.389	2	728	5,340	------	------	------	W.A.# 10
32	SCS Runoff	0.147	2	728	562	------	------	------	YD-1
33	SCS Runoff	0.262	2	728	1,004	------	------	------	YD-2
34	SCS Runoff	0.208	2	728	798	------	------	------	YD-3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SCS Runoff	0.293	2	728	1,125	------	------	------	YD-4
36	SCS Runoff	0.059	2	724	203	------	------	------	W.A.# 9
37	SCS Runoff	6.131	2	726	21,690	------	------	------	DETENTION POND AREA
38	SCS Runoff	6.728	2	728	25,834	------	------	------	W.A.# 2
39	Combine	10.31	2	724	36,551	1, 11, 12, 17, 18, 24,	------	------	To S. Pond (A)
40	Combine	5.742	2	724	18,888	6, 7, 8, 9, 10, 13,	------	------	S. POND COMBINE (B)
41	Combine	14.06	2	724	51,116	2, 3, 27, 31, 32, 37,	------	------	To S. Pond (C)
42	Combine	4.806	2	724	16,716	14, 19, 20, 21, 22, 23,	------	------	S. POND COMBINE (D)
43	Combine	7.255	2	724	25,853	28, 29, 30, 33, 34, 35,	------	------	S. POND COMBINE (E)
44	Combine	42.18	2	724	149,124	39, 40, 41, 42, 43	------	------	To S. Pond
45	Reservoir	7.829	2	752	149,105	44	46.17	65,901	S. Pond Overflow
46	Combine	1.307	2	726	5,075	15, 16, 25,	------	------	DP#1 - To Park Road
47	Combine	18.56	2	728	194,193	4, 5, 38, 45,	------	------	DP#2 - To Culvert
48	Combine	0.245	2	726	984	26, 36,	------	------	DP#3 - To Prospect

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.181	2	724	573	------	------	------	CB-1
2	SCS Runoff	0.248	2	724	795	------	------	------	CB-2
3	SCS Runoff	5.754	2	724	19,457	------	------	------	SOUTH PARKING AREA
4	SCS Runoff	3.765	2	726	13,000	------	------	------	W.A.# 3
5	SCS Runoff	2.473	2	728	9,475	------	------	------	W.A.# 4
6	SCS Runoff	0.514	2	724	1,717	------	------	------	CB-3
7	SCS Runoff	0.448	2	726	1,596	------	------	------	CB-4
8	SCS Runoff	2.487	2	724	8,214	------	------	------	CB-5
9	SCS Runoff	1.440	2	724	4,662	------	------	------	CB-6
10	SCS Runoff	0.893	2	724	2,949	------	------	------	CB-7
11	SCS Runoff	0.391	2	724	1,360	------	------	------	CB-8
12	SCS Runoff	0.695	2	724	2,273	------	------	------	CB-9
13	SCS Runoff	0.681	2	724	2,186	------	------	------	TD-2
14	SCS Runoff	0.464	2	726	1,612	------	------	------	Sisters Courtyard
15	SCS Runoff	0.371	2	724	1,193	------	------	------	W.A.# 5
16	SCS Runoff	1.099	2	728	4,213	------	------	------	W.A.# 6
17	SCS Runoff	1.922	2	728	7,385	------	------	------	W.A.# 1
18	SCS Runoff	1.285	2	724	4,292	------	------	------	CB-10
19	SCS Runoff	1.148	2	724	3,791	------	------	------	CB-11
20	SCS Runoff	1.327	2	724	4,340	------	------	------	CB-12
21	SCS Runoff	0.560	2	726	1,995	------	------	------	CB-13
22	SCS Runoff	0.514	2	724	1,717	------	------	------	TD-3
23	SCS Runoff	1.533	2	726	5,499	------	------	------	TD-1
24	SCS Runoff	7.409	2	724	25,381	------	------	------	W.A.# 11
25	SCS Runoff	0.146	2	726	501	------	------	------	W.A.# 7
26	SCS Runoff	0.233	2	728	903	------	------	------	W.A.# 8
27	SCS Runoff	1.761	2	724	6,120	------	------	------	GARAGE ROOF DRAIN-2
28	SCS Runoff	2.218	2	724	7,707	------	------	------	GARAGE ROOF DRAIN-1
29	SCS Runoff	1.761	2	724	6,120	------	------	------	GARAGE ROOF DRAIN-3
30	SCS Runoff	3.392	2	724	11,787	------	------	------	GARAGE ROOF DRAIN-4
31	SCS Runoff	1.608	2	728	6,202	------	------	------	W.A.# 10
32	SCS Runoff	0.171	2	728	656	------	------	------	YD-1
33	SCS Runoff	0.309	2	728	1,184	------	------	------	YD-2
34	SCS Runoff	0.244	2	728	936	------	------	------	YD-3

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SCS Runoff	0.342	2	728	1,313	------	------	------	YD-4
36	SCS Runoff	0.065	2	724	227	------	------	------	W.A.# 9
37	SCS Runoff	6.944	2	726	24,740	------	------	------	DETENTION POND AREA
38	SCS Runoff	7.970	2	728	30,548	------	------	------	W.A.# 2
39	Combine	11.58	2	724	41,265	1, 11, 12,	------	------	To S. Pond (A)
40	Combine	6.439	2	724	21,324	17, 18, 24, 6, 7, 8,	------	------	S. POND COMBINE (B)
41	Combine	15.86	2	724	57,971	9, 10, 13, 2, 3, 27,	------	------	To S. Pond (C)
42	Combine	5.414	2	724	18,953	31, 32, 37, 14, 19, 20,	------	------	S. POND COMBINE (D)
43	Combine	8.121	2	724	29,049	21, 22, 23, 28, 29, 30,	------	------	S. POND COMBINE (E)
44	Combine	47.41	2	724	168,562	33, 34, 35, 39, 40, 41, 42, 43	------	------	To S. Pond
45	Reservoir	8.873	2	752	168,543	44	46.50	74,064	S. Pond Overflow
46	Combine	1.519	2	726	5,907	15, 16, 25,	------	------	DP#1 - To Park Road
47	Combine	21.24	2	728	221,565	4, 5, 38, 45,	------	------	DP#2 - To Culvert
48	Combine	0.280	2	726	1,129	26, 36,	------	------	DP#3 - To Prospect

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	30.1225	6.6000	0.7676	--------
3	0.0000	0.0000	0.0000	--------
5	52.3308	9.8000	0.8367	--------
10	54.7383	10.8000	0.8016	--------
25	101.9813	15.8000	0.8971	--------
50	98.1551	15.7000	0.8577	--------
100	106.5909	17.0000	0.8462	--------

File name: Connecticut IDF.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.59	3.49	2.85	2.43	2.13	1.90	1.72	1.58	1.46	1.36	1.27	1.20
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.49	4.30	3.57	3.06	2.69	2.40	2.17	1.99	1.84	1.71	1.60	1.50
10	5.99	4.81	4.04	3.51	3.11	2.80	2.55	2.35	2.18	2.03	1.91	1.80
25	6.70	5.52	4.71	4.12	3.66	3.30	3.01	2.76	2.56	2.38	2.23	2.10
50	7.30	6.06	5.20	4.57	4.09	3.70	3.38	3.12	2.90	2.71	2.54	2.40
100	7.79	6.55	5.68	5.02	4.51	4.10	3.76	3.48	3.24	3.04	2.86	2.70

Tc = time in minutes. Values may exceed 60.

Preci. file name: Hartford County. cp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.20	0.00	4.10	4.70	5.50	6.20	6.90
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX C
Design Criteria

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		**39**	**61**	**74**	**80**
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		**98**	**98**	**98**	**98**
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN s are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN s. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN s for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN s shown are equivalent to those of pasture. Composite CN s may be computed for other combinations of open space cover type.

[4] Composite CN s for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN s are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN s to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN s for the newly graded pervious areas.

Table 3-1 Roughness coefficients (Manning s n) for sheet flow

Surface description	n [1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses [2]	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods: [3]	
Light underbrush	0.40
Dense underbrush	0.80

1 The n values are a composite of information compiled by Engman (1986).

2 Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.

3 When selecting n , consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

APPENDIX D
Storm Sewers Analysis

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	40.187	0.00	0.00	0.00	0.00	0.00	0.0	4.0	0.0	8.89	17.89	5.45	24	0.45	44.80	44.98	45.80	46.04	46.50	52.00	STC 900 to S. DE
2	1	48.756	0.00	0.00	0.00	0.00	0.00	0.0	3.8	0.0	8.89	17.54	5.42	24	0.43	45.23	45.44	46.24	46.50	52.00	51.10	CB-3 to STC 900
3	2	51.365	0.00	0.00	0.00	0.00	0.00	0.0	3.7	0.0	8.54	10.53	6.31	18	0.72	45.94	46.31	46.97	47.44	51.10	50.50	CB-4 to CB-3
4	3	36.677	0.00	0.00	0.00	0.00	0.00	0.0	3.6	0.0	8.26	10.45	5.83	18	0.71	46.31	46.57	47.44	47.68	50.50	50.25	CB-5 to CB-4
5	4	190.761	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	4.52	21.23	3.91	18	2.93	46.57	52.15	47.68	52.96	50.25	55.74	CB-7 to CB-5
6	5	116.000	0.00	0.00	0.00	0.00	0.00	0.0	2.4	0.0	3.93	11.96	6.01	15	2.46	52.40	55.25	52.96	56.05	55.74	62.73	CB-9 to CB-7
7	6	77.152	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	3.20	10.43	5.92	15	1.87	57.74	59.18	58.22	59.90	62.73	62.47	CB-10 to CB-9
8	7	115.652	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	2.34	10.62	3.56	15	1.94	59.18	61.42	59.90	62.03	62.47	65.00	CB-11 to CB-10
9	8	177.764	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	1.58	7.55	3.06	15	0.98	61.42	63.16	62.03	63.66	65.00	66.60	CB-12 to CB-11
10	9	91.769	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	0.70	2.91	2.96	12	0.48	63.41	63.85	63.74	64.20	66.60	66.85	CB-13 to CB-12
11	10	20.988	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.34	12.50	1.88	12	8.81	63.85	65.70	64.20	65.94	66.85	67.70	TD-3 to CB-13
12	4	131.954	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	2.09	8.04	4.77	12	3.65	47.19	52.00	47.68	52.62	50.25	62.50	CB-6 to CB-5
13	12	117.499	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.44	1.74	3.47	8	1.48	57.56	59.30	57.79	59.61	62.50	62.00	TD-2 to CB-6
14	6	74.407	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.27	3.45	1.40	12	0.67	55.50	56.00	56.05	56.21	62.73	59.00	CB-8 to CB-9
15	End	27.730	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	1.84	8.50	3.66	18	0.47	46.44	46.57	46.91	47.08	46.50	51.75	CB-2 to S.POND
16	15	17.243	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	1.68	8.42	4.44	15	1.22	46.82	47.03	47.20	47.54	51.75	52.05	CB-1 to CB-2
17	16	40.319	0.00	0.00	0.00	0.00	0.00	0.0	1.4	0.0	1.57	5.78	4.97	12	1.88	47.28	48.04	47.64	48.57	52.05	52.80	YD-4 to CB-1
18	17	69.969	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	1.37	5.87	3.39	12	1.94	48.04	49.40	48.57	49.90	52.80	52.80	YD-3 to YD-4
19	18	23.109	0.00	0.00	0.00	0.00	0.00	0.0	0.9	0.0	1.24	5.54	3.31	12	1.73	49.40	49.80	49.90	50.27	52.80	59.50	YD-2 to YD-3
20	19	128.001	0.00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	1.08	7.23	4.94	12	2.95	56.49	60.27	56.75	60.71	59.50	63.36	YD-1 to YD-2
21	20	68.677	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	0.98	4.24	3.07	12	1.21	60.27	61.10	60.71	61.51	63.36	71.50	Pipe - (36)
22	21	25.983	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.98	6.12	3.18	12	2.12	61.10	61.65	61.51	62.06	71.50	63.65	TD-1 to SMH-1

Project File: 3162 - Proposed Pipe Analysis.stm | Number of lines: 27 | Run Date: 10/13/2015

NOTES:Known Qs only ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	End	42.660	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.16	20.46	5.17	24	0.59	43.25	43.50	44.00	44.38	43.25	46.50	OS to CULVERT
24	End	86.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.51	4.54	1.92	12	1.16	48.00	49.00	50.59	50.70	54.00	54.00	ROOD DRAIN 1
25	End	86.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.20	1.54	3.44	8	1.16	48.00	49.00	50.47	51.08	54.00	54.00	ROOF DRAIN 2
26	End	86.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.20	1.54	3.44	8	1.16	48.00	49.00	50.47	51.08	54.00	54.00	ROOF DRAIN 3
27	End	86.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.30	4.54	2.93	12	1.16	48.00	49.00	50.67	50.93	54.00	54.00	ROOF DRAIN 4

Project File: 3162 - Proposed Pipe Analysis.stm | Number of lines: 27 | Run Date: 10/13/2015

NOTES:Known Qs only ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	STC 900	0.00	0.00	0.00	0.00	MH	0.0	1.50	0.00	1.50	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	CB-3	0.34*	0.00	0.34	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.022	0.022	0.013	0.10	4.36	0.18	4.36	1.0	Off
3	CB-4	0.28*	0.00	0.28	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.021	0.021	0.013	0.09	4.06	0.17	4.06	1.0	Off
4	CB-5	1.65*	0.20	1.85	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.036	0.036	0.013	0.27	7.56	0.36	7.56	1.0	Off
5	CB-7	0.59*	0.00	0.39	0.20	Comb	4.0	2.31	0.00	2.31	1.35	0.030	12.00	0.028	0.028	0.013	0.10	3.65	0.19	3.65	1.0	4
6	CB-9	0.46*	0.00	0.46	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.025	0.025	0.013	0.11	4.60	0.20	4.60	1.0	Off
7	CB-10	0.86*	0.00	0.86	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.036	0.036	0.013	0.17	4.81	0.26	4.81	1.0	Off
8	CB-11	0.76*	0.00	0.76	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.024	0.024	0.013	0.15	6.38	0.24	6.38	1.0	Off
9	CB-12	0.88*	0.00	0.88	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.024	0.024	0.013	0.17	6.97	0.25	6.97	1.0	Off
10	CB-13	0.35*	0.00	0.36	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.10	4.82	0.18	4.82	1.0	Off
11	TD-3	0.34*	0.00	0.34	0.00	Grate	0.0	1.50	0.00	24.00	1.00	0.042	12.00	0.036	0.036	0.013	0.09	2.39	0.17	2.39	1.0	10
12	CB-6 (DOUBLE T	1.65*	0.00	1.65	0.00	Comb	4.0	4.32	5.83	4.32	1.35	Sag	12.00	0.022	0.022	0.013	0.20	9.04	0.28	9.04	1.0	Off
13	TD-2	0.44*	0.00	0.44	0.00	Grate	0.0	1.50	20.00	20.00	1.00	Sag	12.00	0.024	0.024	0.013	0.05	1.98	0.13	1.98	1.0	Off
14	CB-8 (DOUBLE T	0.27*	0.00	0.27	0.00	Comb	4.0	4.62	6.24	4.62	1.35	Sag	12.00	0.005	0.005	0.013	0.06	11.47	0.14	11.47	1.0	Off
15	CB-2	0.16*	0.00	0.16	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.06	3.12	0.15	3.12	1.0	Off
16	CB-1	0.12*	0.00	0.12	0.00	Comb	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.034	0.034	0.013	0.06	1.85	0.15	1.85	1.0	Off
17	YD-4	0.19*	0.00	0.19	0.00	Grate	0.0	1.50	3.12	2.31	1.35	Sag	12.00	0.034	0.034	0.013	0.08	2.28	0.16	2.28	1.0	Off
18	YD-3	0.13*	0.00	0.13	0.00	Grate	0.0	0.00	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.06	2.81	0.14	2.81	1.0	17
19	YD-2	0.16*	0.00	0.16	0.00	Grate	0.0	0.00	0.00	2.31	1.35	0.053	12.00	0.053	0.053	0.013	0.07	1.36	0.16	1.36	1.0	18
20	YD-1	0.10*	0.00	0.10	0.00	Grate	0.0	0.00	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.05	2.44	0.13	2.44	1.0	19
21	SMH-1	0.00	0.00	0.00	0.00	MH	0.0	1.50	0.00	1.50	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
22	TD-1	0.98*	0.00	0.98	0.00	Grate	0.0	1.50	20.00	20.00	1.00	Sag	12.00	0.050	0.050	0.013	0.09	1.70	0.17	1.70	1.0	Off
23	OS	6.16*	0.00	6.16	0.00	Grate	0.0	1.50	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.57	28.25	0.57	28.25	0.0	Off

Project File: 3162 - Proposed Pipe Analysis.stm | Number of lines: 27 | Run Date: 10/13/2015

NOTES: Inlet N-Values = 0.016; Known Qs only; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24	RD-1	1.51*	0.00	1.51	0.00	Grate	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.23	11.47	0.31	11.47	1.0	Off
25	RD-2	1.20*	0.00	1.20	0.00	Grate	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.20	9.94	0.20	9.94	0.0	Off
26	RD-3	1.20*	0.00	1.20	0.00	Grate	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.20	9.94	0.20	9.94	0.0	Off
27		2.30*	0.00	0.00	2.30	MH	4.0	2.31	3.12	2.31	1.35	Sag	12.00	0.020	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off

Project File: 3162 - Proposed Pipe Analysis.stm | Number of lines: 27 | Run Date: 10/13/2015

NOTES: Inlet N-Values = 0.016; Known Qs only; * Indicates Known Q added. All curb inlets are throat.

APPENDIX E
Stormceptor Sizing Report

Stormceptor®

Stormceptor Design Summary

PCSWMM for Stormceptor

Project Information

Date	10/13/2015
Project Name	Arcadia Crossing
Project Number	3162
Location	West Hartford

Designer Information

Company	Design Professionals Inc.
Contact	860-291-8755

Notes

N/A

Drainage Area

Total Area (ac)	2.06
Imperviousness (%)	80

The Stormceptor System model STC 2400 achieves the water quality objective removing 82% TSS for a Fine (organics, silts and sand) particle size distribution.

Rainfall

Name	HARTFORD WSO AIRPORT
State	CT
ID	3456
Years of Records	1954 to 2005
Latitude	41°56'17"N
Longitude	72°40'57"W

Water Quality Objective

TSS Removal (%)	80

Upstream Storage

Storage (ac-ft)	Discharge (cfs)
0	0

Stormceptor Sizing Summary

Stormceptor Model	TSS Removal %
STC 450i	69
STC 900	78
STC 1200	78
STC 1800	78
STC 2400	**82**
STC 3600	83
STC 4800	86
STC 6000	87
STC 7200	89
STC 11000	92
STC 13000	92
STC 16000	93

Rinker MATERIALS™

Stormceptor®

Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s		Particle Size µm	Distribution %	Specific Gravity	Settling Velocity ft/s
20	20	1.3	0.0013					
60	20	1.8	0.0051					
150	20	2.2	0.0354					
400	20	2.65	0.2123					
2000	20	2.65	0.9417					

Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

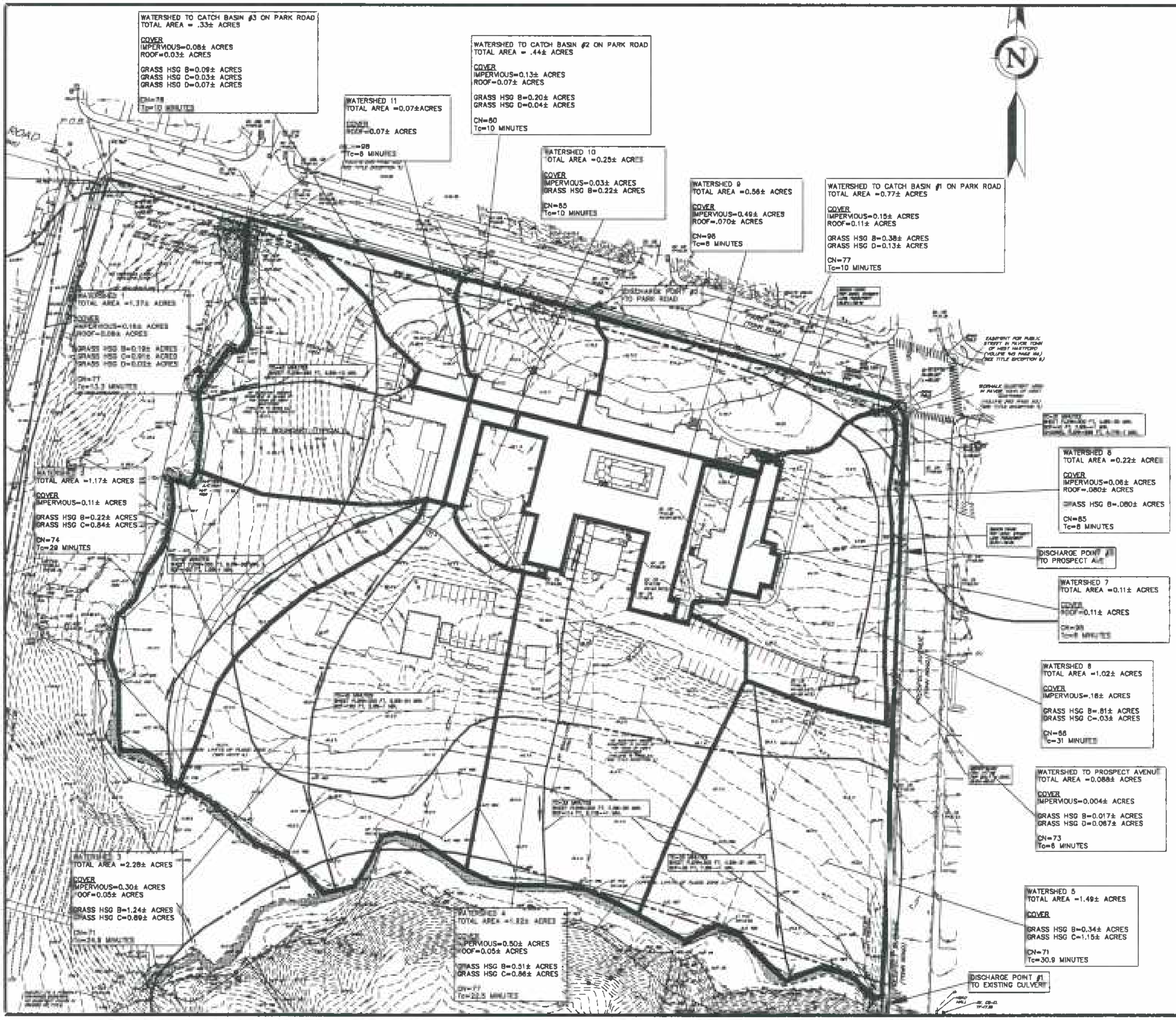
Inlet and Outlet Pipe Invert Elevations Differences

Inlet Pipe Configuration	STC 450i	STC 900 to STC 7200	STC 11000 to STC 16000
Single inlet pipe	3 in.	1 in.	3 in.
Multiple inlet pipes	3 in.	3 in.	Only one inlet pipe.

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

Rinker MATERIALS™

APPENDIX F
Drainage Area Maps


WATERSHED TO CATCH BASIN #3 ON PARK ROAD
TOTAL AREA = .33± ACRES
COVER
IMPERVIOUS=0.08± ACRES
ROOF=0.03± ACRES
GRASS HSG B=0.09± ACRES
GRASS HSG C=0.03± ACRES
GRASS HSG D=0.07± ACRES
WATERSHED TO CATCH BASIN #2 ON PARK ROAD
TOTAL AREA = .44± ACRES
COVER
IMPERVIOUS=0.13± ACRES
ROOF=0.07± ACRES
GRASS HSG B=0.20± ACRES
GRASS HSG D=0.04± ACRES
CN=80
Tc=10 MINUTES
WATERSHED 11
TOTAL AREA =0.07±ACRES
ROOF=0.07± ACRES
Tc=8 MINUTES
WATERSHED 10
TOTAL AREA =0.25± ACRES
COVER
IMPERVIOUS=0.03± ACRES
GRASS HSG B=0.22± ACRES
CN=85
Tc=10 MINUTES
WATERSHED 9
TOTAL AREA =0.56± ACRES
COVER
IMPERVIOUS=0.49± ACRES
ROOF=.070± ACRES
CN=98
Tc=8 MINUTES
WATERSHED TO CATCH BASIN #1 ON PARK ROAD
TOTAL AREA =0.77± ACRES
COVER
IMPERVIOUS=0.15± ACRES
ROOF=0.11± ACRES
GRASS HSG B=0.38± ACRES
GRASS HSG D=0.13± ACRES
CN=77
Tc=10 MINUTES
DISCHARGE POINT #2
TO PARK ROAD
TOTAL AREA =1.37± ACRES
TOTAL AREA =1.17± ACRES
COVER
IMPERVIOUS=0.11± ACRES
GRASS HSG B=0.22± ACRES
GRASS HSG C=0.84± ACRES
CN=74
Tc=29 MINUTES
WATERSHED 8
TOTAL AREA =0.22± ACRES
COVER
IMPERVIOUS=0.08± ACRES
ROOF=.080± ACRES
GRASS HSG B=.080± ACRES
CN=85
Tc=8 MINUTES
DISCHARGE POINT #3
TO PROSPECT AVE
WATERSHED 7
TOTAL AREA =0.11± ACRES
ROOF=0.11± ACRES
WATERSHED 6
TOTAL AREA =1.02± ACRES
COVER
IMPERVIOUS=.18± ACRES
GRASS HSG B=.81± ACRES
GRASS HSG C=.03± ACRES
CN=66
Tc=31 MINUTES
WATERSHED TO PROSPECT AVENUE
TOTAL AREA =0.088± ACRES
COVER
IMPERVIOUS=0.004± ACRES
GRASS HSG B=0.017± ACRES
GRASS HSG D=0.067± ACRES
CN=73
Tc=8 MINUTES
TOTAL AREA =2.28± ACRES
COVER
IMPERVIOUS=0.30± ACRES
ROOF=0.05± ACRES
GRASS HSG B=1.24± ACRES
GRASS HSG C=0.69± ACRES
WATERSHED 4
TOTAL AREA =1.82± ACRES
IMPERVIOUS=0.50± ACRES
ROOF=0.05± ACRES
GRASS HSG B=0.51± ACRES
GRASS HSG C=0.86± ACRES
CN=77
Tc=22.5 MINUTES
WATERSHED 5
TOTAL AREA =1.49± ACRES
COVER
GRASS HSG B=0.34± ACRES
GRASS HSG C=1.15± ACRES
CN=71
Tc=30.9 MINUTES
DISCHARGE POINT #1
TO EXISTING CULVERT
N

NOTES:

1. USDA MAPPING INDICATES THAT THE SOILS WITHIN THE WATERSHED AREA CONSIST OF THE FOLLOWING SOIL TYPES:

ELMRIDGE FINE SANDY LOAM, 0–3% SLOPES, HSG C
UDORTHENTS, HSG B
UDORTHENTS–URBAN LAND COMPLEX, HSG B/D
URBAN LAND, HSG D

CURVE NUMBERS 'CN' & INFILTRATION RATES

GROUND COVER	B	C	D
INFILTRATION RATE (IN/HR)	0.00–1.98	0.00–0.06	Not Available
[illegible]	[illegible]	[illegible]	98
ROOF	[illegible]	[illegible]	[illegible]
GRASS	61	74	[illegible]

* CURVE NUMBERS TAKEN FROM THE USDA TR-55 MANUAL FOR URBAN WATERSHEDS

MAP REFERENCE:

EXISTING CONDITIONS INFORMATION SHOWN ON THIS PLAN TAKEN FROM BOUNDARY & TOPOGRAPHIC PLAN PREPARED FOR SISTERS OF ST. JOSEPH CORP. CONVENT OF MARY IMMACULATE 27 PARK ROAD WEST HARTFORD, CT DATE: 07/11/12 REVISION DATES: 8-20-12, 11-30-12, 05-15-13 BY DESIGN PROFESSIONALS, INC.

Design Professionals
425 SULLIVAN AVENUE
P.O. BOX 7167
SOUTH WINDSOR, CT 06074

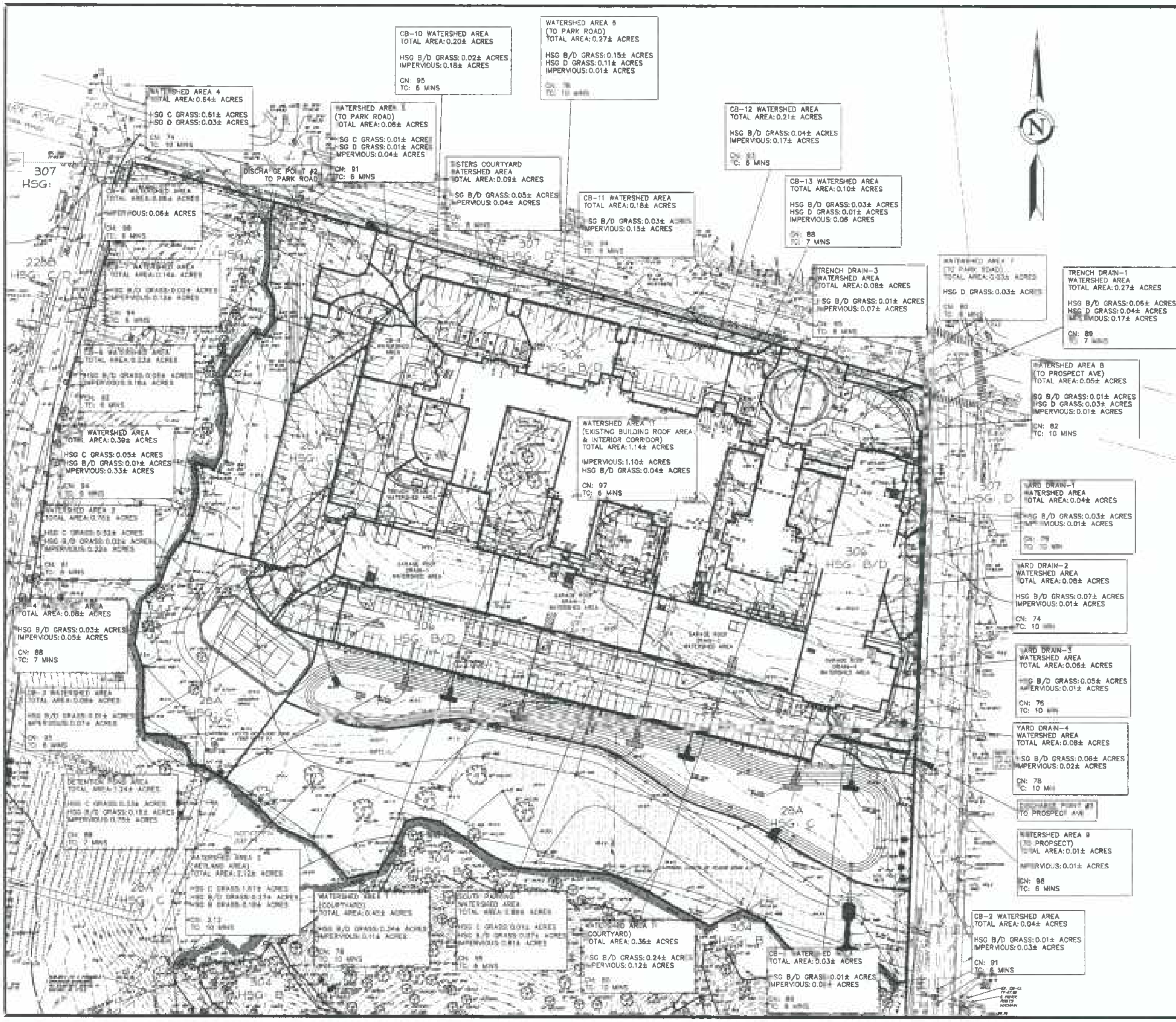
PREPARED FOR:
Sisters of St. Joseph Corp.
Convent of Mary Immaculate
27 Park Road
West Hartford, CT

ARCADIA CROSSING
RENOVATIONS AND ADDITION
ONE PARK ROAD
WEST HARTFORD, CONNECTICUT

REVISIONS

DRAINAGE AREA MAP EXISTING CONDITIONS

SHEET
DA-1


WATERSHED AREA 4
TOTAL AREA:0.64± ACRES
HSG C GRASS:0.61± ACRES
HSG D GRASS:0.03± ACRES
DISCHARGE POINT #2
TO PARK ROAD
WATERSHED AREA 5
(TO PARK ROAD)
TOTAL AREA:0.06± ACRES
HSG C GRASS:0.01± ACRES
HSG D GRASS:0.01± ACRES
IMPERVIOUS:0.04± ACRES
CN: 91
TC: 6 MINS
CB-10 WATERSHED AREA
TOTAL AREA:0.20± ACRES
HSG B/D GRASS:0.02± ACRES
IMPERVIOUS:0.18± ACRES
CN: 95
TC: 6 MINS
WATERSHED AREA 6
(TO PARK ROAD)
TOTAL AREA:0.27± ACRES
HSG B/D GRASS:0.15± ACRES
HSG D GRASS:0.11± ACRES
IMPERVIOUS:0.01± ACRES
SISTERS COURTYARD
WATERSHED AREA
TOTAL AREA:0.09± ACRES
HSG B/D GRASS:0.05± ACRES
IMPERVIOUS:0.04± ACRES
CB-11 WATERSHED AREA
TOTAL AREA:0.18± ACRES
HSG B/D GRASS:0.03± ACRES
IMPERVIOUS:0.15± ACRES
CB-12 WATERSHED AREA
TOTAL AREA:0.21± ACRES
HSG B/D GRASS:0.04± ACRES
IMPERVIOUS:0.17± ACRES
TC: 6 MINS
CB-13 WATERSHED AREA
TOTAL AREA:0.10± ACRES
HSG B/D GRASS:0.03± ACRES
HSG D GRASS:0.01± ACRES
IMPERVIOUS:0.06 ACRES
CN: 88
TC: 7 MINS
TRENCH DRAIN-3
WATERSHED AREA
TOTAL AREA:0.08± ACRES
HSG B/D GRASS:0.01± ACRES
IMPERVIOUS:0.07± ACRES
HSG D GRASS:0.03± ACRES
TRENCH DRAIN-1
WATERSHED AREA
TOTAL AREA:0.27± ACRES
HSG B/D GRASS:0.06± ACRES
HSG D GRASS:0.04± ACRES
IMPERVIOUS:0.17± ACRES
CN: 89
WATERSHED AREA 8
(TO PROSPECT AVE)
TOTAL AREA:0.05± ACRES
HSG B/D GRASS:0.01± ACRES
HSG D GRASS:0.03± ACRES
IMPERVIOUS:0.01± ACRES
CN: 82
TC: 10 MINS
WATERSHED AREA 11
(EXISTING BUILDING ROOF AREA
& INTERIOR CORRIDOR)
TOTAL AREA:1.14± ACRES
IMPERVIOUS:1.10± ACRES
HSG B/D GRASS:0.04± ACRES
CN: 97
TC: 6 MINS
WATERSHED AREA 3
TOTAL AREA:0.39± ACRES
HSG C GRASS:0.05± ACRES
HSG B/D GRASS:0.01± ACRES
IMPERVIOUS:0.33± ACRES
YARD DRAIN-1
WATERSHED AREA
TOTAL AREA:0.04± ACRES
HSG B/D GRASS:0.03± ACRES
IMPERVIOUS:0.01± ACRES
YARD DRAIN-2
WATERSHED AREA
TOTAL AREA:0.08± ACRES
HSG B/D GRASS:0.07± ACRES
IMPERVIOUS:0.01± ACRES
CN: 74
YARD DRAIN-3
WATERSHED AREA
TOTAL AREA:0.06± ACRES
HSG B/D GRASS:0.05± ACRES
IMPERVIOUS:0.01± ACRES
CN: 76
YARD DRAIN-4
WATERSHED AREA
TOTAL AREA:0.08± ACRES
HSG B/D GRASS:0.06± ACRES
IMPERVIOUS:0.02± ACRES
CN: 78
TC: 10 MIN
TOTAL AREA:0.08± ACRES
HSG B/D GRASS:0.03± ACRES
IMPERVIOUS:0.05± ACRES
CN: 88
TC: 7 MINS
WATERSHED AREA 9
(TO PROSPECT)
IMPERVIOUS:0.01± ACRES
CN: 98
TC: 6 MINS
CB-2 WATERSHED AREA
TOTAL AREA:0.04± ACRES
HSG B/D GRASS:0.01± ACRES
IMPERVIOUS:0.03± ACRES
CN: 91
TC: 6 MINS
COURTYARD)
TOTAL AREA:0.36± ACRES
HSG B/D GRASS:0.24± ACRES
IMPERVIOUS:0.12± ACRES
TOTAL AREA:0.03± ACRES
N
307
HSG:
HSG B/D
HSG C
HSG D
28A
304
306
30B

NOTES:

1. USDA MAPPING INDICATES THAT THE SOILS WITHIN THE WATERSHED AREA CONSIST OF THE FOLLOWING SOIL TYPES:

ELMRIDGE FINE SANDY LOAM, 0–3% SLOPES, HSG C
UDORTHENTS, HSG B
UDORTHENTS–URBAN LAND COMPLEX, HSG B/D
URBAN LAND, HSG D

CURVE NUMBERS 'CN' & INFILTRATION RATES

GROUND COVER	B	C	D
INFILTRATION RATE (IN/HR)	0.00–1.98	0.00–0.06	Not Available
IMPERVIOUS	[illegible]	98	[illegible]
ROOF	[illegible]	98	[illegible]
GRASS	[illegible]	74	[illegible]

* CURVE NUMBERS TAKEN FROM THE USDA TR–55 MANUAL FOR URBAN WATERSHEDS

MAP REFERENCE:

EXISTING CONDITIONS INFORMATION SHOWN ON THIS PLAN TAKEN FROM BOUNDARY & TOPOGRAPHIC PLAN PREPARED FOR SISTERS OF ST. JOSEPH CORP. CONVENT OF MARY IMMACULATE 27 PARK ROAD WEST HARTFORD, CT DATE: 07/11/12 REVISION DATES: 8–20–12, 11–30–12, 05–15–13 BY DESIGN PROFESSIONALS, INC.

WATERSHED	TOTAL AREA (ACRES)	HSG: B/D (ACRES)	IMPERVIOUS (ACRES)	CN	TC (MINUTES)
CB-9	0.11	0.02	0.09	[illegible]	[illegible]
TD-2	0.11	0.03	0.08	91	[illegible]
GRD-1	0.34	0.00	0.34	[illegible]	[illegible]
GRD-2	0.27	0.00	0.27	[illegible]	6
GRD-3	0.27	0.00	0.27	98	[illegible]
GRD-4	0.52	0.00	0.52	[illegible]	[illegible]

Design Professionals
21 JEFFREY DRIVE
P.O. BOX 1167
SOUTH WINDSOR, CT 06074

PREPARED FOR:
Sisters of St. Joseph Corp.
Convent of Mary Immaculate
27 Park Road
West Hartford, CT

ARCADIA CROSSING
RENOVATIONS AND ADDITION
ONE PARK ROAD
WEST HARTFORD, CONNECTICUT

REVISIONS

DRAINAGE AREA MAP PROPOSED CONDITION

SHEET
DA-2

ENCLOSURE I
Letter from The Metropolitan District

MDC
The Metropolitan District
water supply • environmental services • geographic information

October 13, 2015

Andrew J. Krar, P.E.
Design Professionals, Inc.
21 Jeffrey Drive
South Windsor, CT 06074

Re: Water & Sewer Availability for Property Located at the Southwest Corner of Park Road and Prospect Avenue, Arcadia Crossing Development, West Hartford

Dear Mr. Krar:

In response to your request, we are confirming the availability of public water and sewer mains located in Park Road and Prospect Street, as well as private lands, which may be used to service the above referenced property. There exists an 8-inch water main in Prospect Avenue, a 30-inch water main in Park Road, and a 12-inch sanitary sewer on private lands within the identified parcel. We are currently processing your request for a capacity analysis based on the information submitted to us on Friday, October 9, 2015.

Permits will be issued after the plans are submitted and approved by the District. There will also be water and sewer connection charges due for the proposed property that must be satisfied prior to the connections being made. The District will notify the owner of these charges upon submission of a certified plot plan or deed to our Customer Service Center, located at 60 Murphy Road in Hartford.

If you have any additional questions, please feel free to contact me at 860-278-7850 ext. 3445.

THE METROPOLITAN DISTRICT

Very Truly Yours,

Michael T. Curley, P.E.
Manager of Technical Services

p.c. Jennifer Ottalagana, MDC
James Eschert, MDC
Utility Services

ENCLOSURE J
Letter from West Hartford Director of Health

WHBHD

October 14, 2015

Peter R. DeMallie
P.O. Box 1167
21 Jeffrey Drive
South Windsor, CT 06074

Re: Sewage Disposal Adequacy
Arcadia Crossing, One Park Road, West Hartford, CT
DPI Project Number 3162

Dear Mr. DeMallie,

The sanitary sewer line that services the above-referenced property appears adequate under normal conditions to accept the peak flow expected to result from the proposed use of this property described in your October 13, 2015 correspondence to this office.

It is our understanding the applicants propose to redevelop the existing buildings and to construct new building additions to house 310 apartment units and 36 residential living units, total number of units, 346. The proposed project will also involve attendant parking which will include garage structures, utility systems, landscaping, lighting and signage.

Contingent upon an acceptable sewer discharge plan by the MDC and an acceptable storm water discharge plan by the Town Engineer, please consider this letter as our statement of adequacy under Section 177-44. C. (1) (e) of the Code of the Town of West Hartford.

Sincerely,

Aimee Eberly RS MPH

Aimee Eberly, R.S., M.P.H.
Assistant Director of Health

Cc: Todd Dumais

West Hartford-Bloomfield Health District
580 Cottage Grove Road, Suite 100, Bloomfield, CT 06002
(860) 561-7900 • Fax: (860) 561-7918

ENCLOSURE K
Application Fee Check made payable to Town of West Hartford

10067

CENTER DEVELOPMENT CORPORATION
ONE GATEWAY PLAZA, 2ND FLOOR
PORT CHESTER, NY 10573

Hudson Valley Bank

50-930-219

PAY Sixty Thousand Seventy and 20/100 Dollars

DATE 10/1/2015

AMOUNT $60,070.20

TO THE ORDER OF: Town of West Hartford

AUTHORIZED SIGNATURE

Memo: Zone Change for Arcadia Crossing

⑈010067⑈ ⑆021909300⑆ 0803665⑈901⑈

CENTER DEVELOPMENT CORPORATION

10067

Town of West Hartford	10067	10/1/2015	$60,070.20
Zone Change for Arcadia Crossing In Payment For:	Purchase #02114123	10/1/2015	$60,070.20

ENCLOSURE L

Plan set entitled "Arcadia Crossing, One Park Road, West Hartford, Connecticut, Zone Change & SDD Designation Application" prepared by Design Professionals, Inc., et. al. dated October 14, 2015